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Special Methods and Psychology of the Elementary-School Subjects

Literature reviewed from July 1, 1934, to July 1, 1937

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FOREWORD

IN THIS THIRD CYCLE of the *Review of Educational Research,* the topics "Special Methods" and "Psychology of School Subjects" are brought together for the second time—in the first cycle they were treated separately, which caused considerable overlapping. There is still overlapping with *The Curriculum,* but the general policy of making each number reasonably complete has been followed even though it results in some duplication. A slight change in the sequence of issues has been made, to publish the material on elementary-school subjects first; the issue on high-school and college subjects will appear in February 1938.

Under the chairmanship of Arthur I. Gates the plan of cooperative preparation of chapters has been extended. First tried in the previous cycle, in connection with the chapter on Reading, it has this time been applied to all of the chapters in this issue. It involves the cooperation of a number of specialists in each field, usually in checking the bibliography, and in suggesting revisions in the context, as initially prepared by the chairman of the chapter committee.

The subjects treated follow those of the corresponding number in the preceding cycle, except that music has been added. Handwriting and industrial arts are again omitted because of lack of material.

DOUGLAS E. SCATES,
Chairman of the Editorial Board.

CHAPTER I

Arithmetic

Leo J. Brueckner, with the cooperation of G. T. Buswell, Frederick B. Knight, Guy M. Wilson, and Clifford Woody

Children's Early Number Experiences

SEVERAL INVESTIGATORS have extended the research dealing with the familiarity of young children with numbers, which was summarized in the last *Review of Educational Research* on special methods in the elementary school. MacLatchy (33) summarized studies dealing with the number facts children know at the time they enter school. McLaughlin (34) inventoried the ability of children to deal with numbers at early ages and the methods of generalization they employed. She found the same gradual growth in ability to count and the same kind of variability in the amount of knowledge of number that had been reported in earlier studies. Russell (40) showed that the child's first number concept is "manyness" from which the quantity and serial aspects of number differentiate. He found that the cardinal and ordinal concepts develop simultaneously. He recommended the increased use of meaningful experiences and concrete materials in arithmetic work in the primary grades and less stress on routine drill on number facts.

Polkinghorne (36) found that children in the primary grades have very little understanding of fractional concepts and vocabulary other than simple unit fractions. The knowledge increased very slowly during the first three grades in school. She found that the few concepts the children did have had been learned through concrete experiences in which they had observed actual applications of the fractions. These findings have an important bearing on the curriculum in the primary grades.

Hildreth (27) devised a series of tests of "number readiness." The tests consisted of several parts—perception of pictures, symbols and numbers, vocabulary, words and sentences, number knowledge, and general drawing. About a hundred children were tested during the first month in school. Later diagnostic tests were given to these children in Grades I, II, and III, to measure the arithmetic they had learned. The correlation between scores on the readiness test and the results of the diagnostic tests for third-grade pupils was .58, and for second-grade pupils, .497. While these correlations are not high, Hildreth pointed out that the initial readiness test scores are valuable for guidance and classification purposes with pupils who score low on the test. She reported that "the best and poorest learners could be predicted with fair reliability." It is to be expected that arithmetic readiness tests will be greatly improved in the not distant future since their value for instructional purposes is obvious.

Vocabulary Studies

Gunderson (22) analyzed the arithmetic vocabulary found in ten sets of primers and readers for Grades I and II. She found 416 items mentioned in all 22,916 times. The items were classified into fourteen groups. The five groups containing the largest numbers of items were those referring to size, quantity, time, location, and numbers expressed in words. A wide variation in the range of the vocabulary of the various books was revealed.

Grossnickle (14) constructed a test of understanding of concepts in social arithmetic that appeared commonly in thirteen series of arithmetic textbooks for the upper grades. The items dealt with the topics: banking, stocks and bonds, taxation, insurance, merchandising, building and loan associations, and installment buying. The results for eight of the ten school systems in which the test was administered showed considerable similarity in the median scores. The results for two systems were considerably below those of the others, indicating differences in the stress placed on these social concepts in the several systems. The scores for boys were superior to those for the girls. The highest degree of mastery was for the group of items dealing with taxation and lowest for the merchandising group. The mastery of individual items varied from 11.5 percent to 95.8 percent. The scores on the test correlated negatively with chronological age and positively with mental age.

Levels of Attainment

Brueckner (8) made a study of the variability in arithmetic ability of bright 4A-5B children (I.Q. 100-129) and dull 4A-5B children (I.Q. below 85). On tests of computation, problem solving, vocabulary, and understanding of quantitative relationships the means of the bright group were in all cases higher than those of the dull group. In both groups there was a very wide range in the scores on all four tests, the standard deviations for each test for both groups being practically the same. This wide range in scores indicates the need of making adequate provision for individual differences among both bright and dull pupils in instruction dealing with the various objectives measured by these tests. The relatively low intercorrelations between the results for the various tests show the need of recognizing differences in the levels of attainment of the same pupil in the abilities measured by the different tests.

Gundlach (23) gave a series of tests in the four fundamental operations in fractions to pupils in Grades VII to XII. He found a gradual although small increase in the mean scores for the addition, subtraction, and multiplication tests from Grade VII to Grade XII. For division he found a decrease in the mean scores from Grade VIII to Grade XI, but in Grade XII the score was higher than in any of the other grades. He compared the growth curves for groups of pupils of these different mental levels and found that the curves for each group were similar in character to those

for the whole group but at different levels corresponding to the various mental levels. The variability of the scores of the pupils of the highest mental level was less than for the group of the lowest mental level. There is no evidence that ability in fractions decreases due to disuse at the high-school level.

Methods of Teaching

Presenting number combinations—Knight (30) reported an advantage in the perceptual value of the diamond configuration over the linear and domino forms for all numbers from 6 to 12 with the exception of 8. As a basis, he used a study in which sixty-three photographs as various forms and materials were presented to 100 pupils in Grades II to IV. The pupils made fewer errors on photographs of dots than on photographs of splints and dolls. The number "11" was the most difficult in almost all of the configurations employed. Harter's work, reported by Knight (30), advocated a further use of photographs in teaching number combinations and in developing real understanding. She arranged and photographed various objects for the purpose of utilizing tri-dimensional space as an aid to teaching. No data were reported as to the effectiveness of various kinds of photographs.

McConnell (31) failed to find any significant advantage for either of two methods in an extensive experiment concerned with teaching basic addition and subtraction combinations to second-grade pupils. One method stressed the repetition of stimulus-response connections, the other the dynamics of discovery of truth and meaning—the Gestalt approach. Large comparable groups and a long period of time contributed to the reliability of the study. The data tended to show that the stimulus-response method gave better immediate recall while the other was somewhat better for deliberate and meditative attack. Questionnaires showed that neither developed a greater liking for arithmetic than did the other.

Teaching of processes—Breed and Ralston (2) claimed a superiority for the indirect over the direct method of teaching addition combinations. For bright pupils this advantage was found in both complex addition and in skill in combinations. Slower pupils responded better to the indirect method in the teaching of isolated combinations.

Grossnickle (19) showed that checking in division was of little benefit for fourth-grade classes. By analyzing the papers of 450 pupils who had been taught to check division by the multiplication process, he found that pupils did not grasp the value of checking, but rather merely arranged figures so that the answers would agree. He concluded that time spent on checking at this grade level can be utilized to better advantage.

Upton's plan (41) for teaching long division sought to remove that process from the realm of trial and error estimation of quotients by proposing a method for determining a quotient figure which was correct in the great majority of cases, generally called the "increase-by-one method." He analyzed the procedures in common use for obtaining a quotient figure

and for its testing, thus calling attention to the present lack of a standardized system. As a substitute, he proposed a definite method for two-figure divisors combined into five rules. This provided a means for finding a quotient figure which is correct on the first trial in 80.43 percent of all cases and which was either correct or differed from the true quotient by only one point in 99.72 percent of the possible cases. Upton gave no experimental evidence in support of his contention. Grossnickle (16) found no significant difference between the results for two groups of classes, one taught to use the "increase-by-one method" indorsed by Upton, and the other taught to use the apparent method.

G. M. Wilson (46, 47) presented data supporting a program of drill based on a body of limited essentials and the setting of a standard of "100 percent mastery" for this drill.

Organization of practice—Brownell and Chazal (5) pointed out the inadequacy of premature drill as a means of developing efficient methods of work. They found that drill in addition and substraction combinations in the third grade did not guarantee immediate recall, nor did it tend to change pupils' methods of work which had previously been found to be faulty or inefficient. Their study pointed out the importance of teaching correct methods of work before drill is assigned. Repp (39) identified two types of drill as isolated and mixed. The isolated types, consisting of examples of one kind, were recommended for drill when in close proximity to teaching; the mixed, consisting of several kinds together, were to be used for maintenance purposes. Experiments showed that pupils given both oral and written drill made larger gains than were made by groups having only oral or written drills.

Several studies (25, 26, 38, 42) demonstrated the possibility of teaching numbers through activity or experience units. The conclusions of these reports uniformly stressed the desirability of teaching number processes through first-hand contact with their use in the experiences of daily life and the advisibility of eliminating useless processes.

Transfer of training—Grossnickle (20) made a study of the transfer of knowledge of multiplication combinations to their use in long division examples with single digit divisors. He first tested the pupils on their knowledge of the multiplication combinations. Then he analyzed the work of the pupils in long division to discover the errors in the multiplication combinations involved. He found over twice as many incorrect products given on the significant facts in the division test as were given in the same facts in the multiplication test. Only 2 percent of the errors were common to both tests. He concluded that there is only partial transfer of a knowledge of multiplication facts to their use in long division process. He also concluded that a pupil's knowledge of multiplication facts is not constant at all times and that many chance errors are made. Practice in the use of multiplication facts in division examples is necessary. No data were given as to the reliability of the instrument used.

D. W. Wilson (45) gave tests to children in Grades III to XII and to a sampling of adults in various parts of the country to determine their knowledge of units of measure and their ability to apply them in situations typical for the various regions. She also tested the relations between some of the units of measure, such as the relation between feet and inches. The results showed that those tested knew fairly well the units and applications related to the resources of the locality in which they lived, but knew very little about units not locally used, even though they had been taught in school. The teaching had evidently not been functional. D. W. Wilson advocated the use of concrete experiences to insure understanding of denominate numbers.

Overman (35) made a summary of research dealing with transfer of learning in arithmetic and listed a series of problems that should be investigated.

Survey of teaching practices—Brueckner (6) presented data as to the kinds of instructional practices actually employed in arithmetic lessons. Reports from 505 observed lessons obtained by means of data in a detailed checklist revealed a sampling of what are probably common procedures. He found the major objective of the lesson to be the development of skill in computation, and the development of skill in solving problems which stress processes. Little attention was paid to the informational and social values of arithmetic. The textbook or workbook was the basis for the organization of the lesson in 39 percent of the classes. In a large proportion of classes, no textbook was used. Attempts to individualize instruction were reported for 50 percent of the classes. Little evidence of attempts to enrich and vitalize instruction was reported. Concrete experiences involving applications of numbers were seldom used. Only 4 percent of the classes used local illustrative materials. Class and individual progress graphs were in evidence in 19 percent of the classrooms.

Diagnosis in Arithmetic

Interrelations of objectives—Brueckner (7) pointed out the need of relating diagnosis to the outcomes in arithmetic that are desired. He presented a specific list of outcomes in arithmetic which could form the basis of tests of achievement. He also reported on the interrelationship between the results of scaled tests of computation, problem solving, vocabulary, and quantitative relationships, intending to measure some of the kinds of objectives contained in this list of desirable outcomes. The range of correlation coefficients between the scores on these tests was from .361 between computational ability and vocabulary and .417 between computational ability and understanding of quantitative relationships to .661 between vocabulary and quantitative relationships and .691 between computational ability and problem solving. The conclusion was reached that there is a highly variable relationship among the various kinds of outcomes; and that to be certain that all of them are achieved, instruction must make definite provision for training related to all of the desired outcomes.

Clearly, emphasis on computational arithmetic alone will not develop a quantitative vocabulary, an understanding of the use of numbers in daily life, or the ability to apply numbers in specific situations. This fact can be emphasized by consistently relating measurement of results to the wide range of desired objectives.

Analysis of errors—Grossnickle (15) made a study of the kinds of errors made by pupils using the long division form with one-figure divisions. Guiler (21) showed the value of diagnosis of errors in improving instruction in fractions.

Reliability of diagnosis—Brownell and Watson (4) made a study of the relative value of two diagnostic technics, the personal interview method and the analysis of errors in the test papers. In the former the pupil was asked to "think out loud" as he worked. The examiner recorded what the pupil said. No further interview was made at the time by the examiner to analyze the methods employed. In the second method the examiner contented himself with merely analyzing the written work to discover the errors made. The question of the accuracy of diagnosis of errors by this method was investigated. In all, fifty-five categories of error based on an analysis of the interview were identified. Interview records were analyzed by one individual and test papers by another individual. Correlations between these ratings were computed. The correlations between the general data on the two methods as to the number of incorrect examples and the number of faults per example were quite high (.81 to .98). However, much lower correlations were found between the types of specific faults revealed by the two methods of diagnosis. The interview method was shown to be clearly the superior one.

Brueckner (9) pointed out that the variability of performance of pupils under different conditions is an important factor to bear in mind in making a diagnosis. He also showed that errors in working examples are highly variable and that it is not safe to make a diagnosis of difficulty on the basis of the results of tests containing a single example of a given type. In most instances, at least three examples of a type should be used in a test. Grossnickle (18) reached the same conclusion on the basis of a diagnosis of errors made by pupils in division with one-figure divisors. These findings have an important bearing on the setting up of acceptable, scientifically valid specifications for the construction of diagnostic tests.

The incidence of error—Grossnickle (17) made a study to determine if there was a tendency for the first error in the quotient of examples with one-figure divisors to appear in the first, second, third, or fourth figure in the quotient in the long and short division forms. In both forms there was a rapid increase in the percent of first errors made in the first three quotient places, the largest percent being in the third place. In 20.8 percent of the cases the first error in the long division form appeared in the fourth quotient figure, while in only 12.9 percent of the cases did the first error in the short division form occur in the fourth quotient figure.

Grossnickle concluded that a pupil's attention span was less interrupted and more constant when the long procedure in division was used, and recommended that the long form of division be taught in the grades.

G. M. Wilson and Porter (48) made a study of the relation between the location of a multiplication combination in an example and the number of errors made in the combination. A test of eight examples was given to 370 pupils in Grades IV, V, and VI. The combination 7 x 9 was placed in various locations in the examples. An analysis of the results showed that there was no relation between the location (lateness) of this combination and the percent of error on the combination. This conclusion does not agree with the results of an earlier study by Knight and Ford, who had found a definite correlation between difficulty and "lateness" of appearance of a combination in an example. Wilson and Cooper suggested that the discrepancy may be due to the difference in teaching procedures used in the two experiments.

Pyle (37) tested children in Grades III to XII with a group of ten problems ranging from easy to difficult. Some of the problems involved unusual computations. For each of the types he found a steady increase from grade to grade in the percent of pupils who could solve them correctly. His data showed the importance of recognizing the gradual growth of reasoning ability in the preparation of problems for each grade.

Problem Solving

Investigation in the field of written problems during this period registered a notable advance. Reports for the previous periods (*Review of Educational Research* for October 1931, December 1931, and February 1935) showed chief interest in the relative importance of the factors contributing to the solution of the traditional isolated textbook problem. High ranking among such factors are general intelligence, computational ability, and reading ability. During the present period there are two studies of similar nature by Pyle (37) and Dickey (13). The other studies shift to the important social viewpoint, and discover for us that nothing ranks in significance with the provision that problems, in school as in life, should deal with vital experience of the child and the community.

Pyle (37) used ten self-made problems of the older type in a study of the development of "reasoning ability" through the grades. He found steadily advancing scores on these ten problems, through Grades III to XII. He noted slight sex differences in favor of boys. He concluded that "problems involving reasoning in the arithmetics of elementary grades are too difficult." Dickey (13) experimented with 168 sixth-grade pupils to find the effect of estimating answers of problems in advance. One-third of the 15-minute period on problems for fifty days was devoted to estimating answers. The growth in problem solving was measured by using two forms of a traditional standardized test. He found no significant difference in the growth in the ability of an experimental and a control

group to solve artificial textbook problems. No data were given to show improvement in other problem situations.

The study by Connor and Hawkins (12) involved the pupils of the Cleveland schools from the upper half of the second grade through the eighth grade. In the experiment no use was made of problems of the traditional textbook type. Instead problems were used that were collected by the teachers and pupils from their environment, selected for solution after class discussion as to relative worth, and then dramatized or illustrated by "dynamic" illustrations in which the numbers were small. The problems thus grew out of a clear and well-understood objective situation. Considerable growth in ability as measured by traditional problem tests was revealed. There was no control group in this study.

Janes's analysis (28) of problems in textbooks threw some light on the Connor and Hawkins' conclusions. Janes found that an average arithmetic series contained problems dealing with a variety of business situations, an average of 625 problems per series, or about 100 per grade. Checking on adults (by Wilson, unpublished) showed that it is an exceptional individual who can check a total of 100 different business situations as experienced. Knight (30) reported that in three fourth-grade textbooks many of the problems were difficult, that there was little correlation of arithmetic problems with the work in the other school subjects, leading to a rigid compartmentalization not present in actual child life, and that the problems were largely unrelated to each other. Better organization and selection were recommended. It appears that the pupils would profit greatly by the reduction of emphasis on meaningless problems and the wider use of problems growing out of the experiences of children.

Illustrations of the effectiveness of teaching number by the personally significant, experience types, of problems were supplied by Harap and Mapes (26) and Harap and Barrett (25). Harap and Mapes showed how an entire year's work of a sixth grade was limited to thirteen sizable problem units from real life. They also showed how the use of decimals needed in these units led to better mastery of decimals than the usual systematically organized drill in decimals. Apparently decimals should be learned through usage rather than through drill. These studies of the value of activities in teaching arithmetic are highly suggestive for curriculum makers.

Selection and Arrangement of Subjectmatter

Enriching arithmetic—Buckingham (10) and Buswell (11) published statements in which emphasis was placed on methods of vitalizing the contents of instruction in arithmetic. The view was expressed by both that learning could be made easier by presenting the import aspects of numbers in such a way that their meaning and utility would be evident to the students.

Activity work—Wahlstrom (42) and Reid (38) showed that a wide variety of relatively easy arithmetic is encountered by primary-grade pupils

in their social experiences in life outside and in the school. These contacts help to give meaning to the work in arithmetic. Hanna (24) presented evidence showing that in a typical activity curriculum there was very little contact with the application of numbers. He pointed out that the activities had not been selected because of the arithmetic they involved but for other reasons. Hanna concluded that it would be quite possible to select individual units in which there could be much more contact with numbers than in the units involved in his experiment. The correctness of this conclusion is demonstrated by an investigation by Harap and Mapes (26) which showed that decimals could be effectively learned in a series of "activities," selected because they gave experience in the use of decimals. Decimals were learned not through systematic drills and practice but only through the incidental contacts with their use in the course of the social activities. Harap and Barrett (25) experimented with the effectiveness of "experience" learning through activities in third-grade arithmetic. A large variety of projects were engaged in. It was found that with no formal teaching of the processes in whole numbers there was 93 percent mastery of the processes ordinarily included in the curriculum of the grade. It is evident that insistence on logically constructed systematic drills may overlook important values that grow out of informal but planned contacts with numbers in situations in which the processes are applied by the pupils as they are needed.

Children's participation in business practices—Warren and Burton (43) compiled a list of consumer business practices performed by adults. A group of 1,050 fifth- and sixth-grade children were required to check the operations in the list that they had performed "often," "seldom," or "never." The items were grouped under telephone operations, banking operations, money-handling operations, travel services, mailing operations, and miscellaneous operations. The frequency with which individual items were performed ranged from 99.2 percent (buying anything) to 1.9 percent (using a safe-deposit box). The data were given for eighty-three items. The pupils performed more than half of the activities listed by the adults. No important differences were noted between boys and girls. The procedure used by Warren and Burton suggested a method of studying the needs of both adults and children as the basis of selecting subjectmatter that has the greatest social value. This study should be extended to include a wider variety of activities and to a larger number of grades and pupils.

Difficulty of topics—G. M. Wilson and Dalrymple (49) summarized studies of the kinds of fractions used by occupational and social groups. They showed that in ordinary computations very simple fractions are used. However, they made no study of the kinds of fractions appearing in scientific writings which must be read and understood, but which are ordinariy not involved in computation. G. M. Wilson (50) again presented the view that the drill content of arithmetic should be greatly

simplified so as to insure mastery of essentials, but he recognized the "informational" value of knowing how to deal with more difficult skills which are not to be drilled on for mastery. Johnson (29) found that pupils learned to manipulate fractions very effectively when the decimal form rather than the common fraction form was taught. This was especially true in the addition and substraction processes.

Gradation of subjectmatter—Washburne (44) published a statement in which he discussed the values and limitations of the work of the Committee of Seven and commented on criticisms that have been made of its findings. He also outlined a course of study in which the grade placement was made in accordance with the findings of this committee, which vary considerably from the traditional course. The need of further study of grade placement was pointed out.

Grossnickle (16) conducted an experiment on the effectiveness of two methods of teaching long division. He found little difference in the effectiveness of the "apparent" method and the "increase-by-one" method. However, he did reach the important conclusion that long division with two-place divisors can be taught with success to pupils of average mental ability in Grade IV. He pointed out that this conclusion is at variance with that reached by the Committee of Seven. This committee found that the most suitable point for teaching long division was at the time when the pupil had a mental age of twelve years seven months, or at about the middle of the sixth grade. Grossnickle pointed out that the difference in the findings of the two studies may be due to the greater care he used in constructing the drill materials and the constant checking he did in a supervisory capacity. Grossnickle did not teach the divisors 13 to 18, and did not test for delayed recall as the Committee of Seven did. These results emphasize the need of further study of the grade placement of the various number processes.

MacGregor (32) made a comparison of the achievement of children in one of the counties of Scotland with those of the children of America. In this Scotch county formal instruction in arithmetic was introduced at the age of five years. The author, after very careful consideration, arrived at the conclusion that the cause for 1 to 2 years superiority of achievement of the Scotch children over that of American children was due to the fact that formal instruction in arithmetic was introduced at the age of five.

Analysis of textbooks—Knight (30) reported two studies dealing with the analysis of arithmetic textbooks. One study concerned the sociology of verbal problems in three fourth-grade textbooks; that is, the social setting of the problem, and the worth of the setting. It was found that the texts stressed child interest, "an upper middle-class society," the present time, money, boys and men, and the play element. Knight contended that problems in textbooks should illustrate for the pupils the kinds of activities of daily life in which number is used since it is not possible to experience many applications of numbers directly. The analysis of illustrations (30)

in eight fourth-grade textbooks dealt with their number, functional use, color, social situation, and pupil-teacher appeal. Wide variations were found in these various factors. Many pictures had little appeal to either pupils or teachers. Many were not related to the contents of units but were "window dressers." The first third of each book was better illustrated than the rest of the book. Illustrations supporting the teaching of some process were more frequent and better than those related to social applications of numbers. It is evident that the technic of textbook illustration is in its infancy. The setting up of technics of objective appraisal is an important contribution to a program for improving the quality of textbooks.

Brooks and others (3) checked the distribution of drill in essential addition facts in third- and fourth-grade textbooks. A wide variation was found among five textbooks analyzed. This study presented evidence of the need of care in the construction of drill materials. Beattie (1) pointed out the need of care in the construction of diagnostic inventory tests.

CHAPTER II

Art

William G. Whitford, with the cooperation of Norman C. Meier and Joseph E. Moore

The Current Status of Research in the Arts

THE PERIOD covered by this review has been one characterized by changes in educational objectives and an experimental school program aiming to meet the new objectives. Many investigations have been made in regard to the elementary-school curriculum and the methodology of presenting and administering subjectmatter.

Most of the investigations in this field of art education, however, have been conducted as routine procedures rather than as scientific studies. A recession of carefully controlled research in respect to the art curriculum during the last three years is apparent. This condition is partly due to lack of funds for conducting the work. Several large institutions, normally active in research in this and related fields, reported that activities had been suspended because of financial reverses in operating budgets. A number of the references included in the bibliography accompanying this review are, therefore, generalized reports of experimental work. They are of value as literature of an investigational nature and as aids in developing the field of elementary art education.

In evaluating objective research in the arts the large number of master's and doctor's theses completed at various institutions of higher learning deserve attention. It is the graduate student, working under the guidance of faculty directors, who is making the greatest contribution to research in problems of art education. A mass of significant data has been compiled, but most of it is in unpublished form. One of the greatest needs at the present time in regard to research in the arts is some means of making these studies conveniently available in printed or multigraph form. Only the few theses which have been published are included in the bibliography (73, 94, 100, 101, 107, 143); these indicate the scope and character of this important but little recognized class of contributions to the research field.

Trends in Art Education

From analysis of the literature covered in this review it is evident that growing emphasis is being placed upon an educational approach to the teaching of art rather than the "ultra-child-centered" concept of a few years ago. Creative expression in the arts continues to receive attention in the new curriculum, but with growing emphasis upon the significance of the creative effort and its attendant educational value. The life-need, or social objective, shows a steadily growing acceptance along with a modified curriculum to incorporate this trend of art education. Integration of art

with social studies or other activity programs is making exceptional headway in the schools. This approach to art has introduced the unit conception of organizing and administering the art curriculum, either as an independent subject or in interrelationship with other activities of the school. Art appreciation has been given a new significance as a broad phase of social understanding, not merely picture-study as formerly practiced in the schools. More emphasis is being given to visual education in the arts with consideration of the motion picture and the radio as developments of far-reaching significance.

Scientific Analysis of Art Problems

Analytical studies have been made of the drawing and painting activities of children by the following authorities: Anastasi and Foley (51), Berrien (55), Dickson (63), Engel (65), Graewe (75), Hartenstein (78), Hinrichs (81), Horovitz (83), Hurlock and Thomson (84), Krebs (92), Saunders (101), McElwee (97), Peck (114), Perrine (115), Seeman (123), Scheer (122), and Zesbaugh (143).

Buswell (59), Miller (104), and Morrison (107) completed research in connection with picture analysis and picture choices of children. Studies in art appreciation have been made by Bishop (56), Lewis (93), Lowe (94), Voss (101), Whitford and Lick (133), Ross (120), and Shultz (125). Johnson's study (86) of the emotional responses of children suggested a rich field for research in the arts. We know very little in regard to the development of the emotions through contact with the arts. Gerwig (71) indicated something of the possibilities from this type of investigation. Flemming (68) and MacDonald (95) presented studies in relation to character and personality development. Krägeloh (91) and Walton (101) introduced the factor of emphatic responses of children.

Crawford and Malin (61), Rankin (116), and Rusk (121) made contributions to the study of special methods of teaching art. Analysis of problems pertaining to the development of art in the integrated program were presented by Irwin (85), D'Amico (62), Glace (73), Mathias (99), Newcomb (111), and Welling (132). Haggerty (77), Hilpert (80), and Ziegfeld (144) suggested ways in which research pertaining to surveys of art needs in life contribute to the formulation of broad fields of art education. A very extensive analytical study of the curriculum for the elementary grades, including much valuable material pertaining to the arts, was conducted for the state of Virginia (130) under the direction of Superintendent of Public Instruction Hall.

Meier developed an extensive research program in connection with the graduate work of the Department of Psychology, University of Iowa. Qualitative and quantitative studies in the graphic and plastic arts have been carried on for several years. Extensive testing procedures were developed including a newly invented apparatus for fabricating esthetic organizations and controlling these at will. Studies supervised by Meier (101) involved investigations with children in appreciation, empathy,

validity of art tests, measurement of qualities in painting, comparison of artistic ability and general intelligence, stability of artistic aptitude, and a case study of Loran Lockhart. Contributions were made by Meier on talent in children (102) and diagnosis in art (100).

Mott (108, 109) and Whitford (137) indicated possibilities of research in respect to art concepts and the concept method of teaching. Baker, Whitford, and Winslow investigated the functional approach to art education (52, 134, 140), the unit conception of organizing the art curriculum (135, 141), and the present status of art in American education (136).

Gates and Brown (70), Gray (76), Meloun (103), Voorhis (131), and others experimented with the comparisons of manuscript and cursive writing. Lettering has always been an aspect of art education. These studies seemed to indicate that achievement in handwriting might be improved by incorporating it with the art program.

The use of the motion picture in art education was discussed by Eyraud (66) and Katz (87), and demonstrated by Bement (53). Comparison of the art educational program of Europe and the United States was carried on by Reid (117) and Reynolds (118).

Several bibliographies of art education were compiled which will be of great assistance to research workers—Garrison (69), Glace (73), Hiss and Fansler (82), Meier (101), Mitchell and Smith (105), Morey and Youtz (106), Vernon (129), Whitford (135), Nicholas, Mawhood, and Trilling (112).

Measurement in Art

Several significant contributions have been published in the field of tests and measurements. Mann (98) experimented with objective tests in the industrial arts. Knauber (88, 89, 90) produced tests for the measurement of various kinds of art ability and the art vocabulary. Bulley (58), Findley (67), McElwee (96), Pan (113), and Steggerda (126) reported the results of tests in esthetic judgment, factor analysis, and visual memory.

CHAPTER III

Character Education

Vernon Jones, with the cooperation of Mark A. May, Willard C. Olson, and William Clark Trow

Evidences of Faddism

CHARACTER EDUCATION during the period under review has been sailing a precarious course between the inviting voice of faddism on the one hand and the courage-sapping rocks of controversy on the other. The dangers of faddism were depicted by Trow (208, 209) who saw character development rightfully being accepted by educators as a worthy objective, but who also detected evidences of the adoption of easy, overadvertised methods and programs which ignore the findings of experimental work. He cited excess in the use of codes, mottoes, and emotional preachments. Flag saluting, and nicotine fighting, he thinks may easily become a craze, or degenerate into a formal routine. In contrast with this enthusiasm for certain "pet" schemes, there is on the part of others much hesitation, confusion, and doubt, born of conflicting theories and interpretations.

Some Controversial Issues and Research upon Them

One of the most disconcerting points of disagreement for the student of character education is that concerning the nature and definition of character. To some, character is the totality of many traits; to some, it is an integrated behavior pattern built around a few factors; and to some, notably the devotees of the German school of characterology, it is practically coextensive with personality. For detailed discussions and reviews, see (179, 181, 182, 199, 202, 203, 206).

The angle of this problem which has attracted most attention in this country, and which has made for a good deal of confusion in education, has been that concerning specificity versus generality (161, 173, 205). It is interesting to note, however, that during the period under review the heat of this controversy seems to have diminished a good deal. Perhaps it is too early to predict the outcome, but the trend seems to be toward a middle-of-the-road position. Such a position was well stated by L. B. Murphy (188), who said that variations in a child's behavior and even apparent contradictions are to be understood in terms of his own psychological relation to the situation to which he is responding and the symbolic values of the situation to him at that time. Elsewhere the same writer, in collaboration with G. Murphy (187), said that the present trend is toward placing less emphasis upon isolated stimuli and responses and more upon functionally significant situations and upon the dynamics of the behavior of the whole organism.

A second conflict which has confused educators is that between the hereditarians and the environmentalists. Popenoe (194) summarized four German studies on the criminal records of twins. About two-thirds of the pairs of identical twins had similar criminal records. He concluded that we must ascribe to heredity a more important rôle in the production of inferior moral behavior than we have in the past. Köhn (180), Saller (197), and Bonaventura (150) also gave interesting evidence in favor of heredity. Of course none of these writers intimated that environment has no place in accounting for moral or immoral behavior, but each strongly stressed heredity. On the other hand, Thrasher (207), in the revision of his work with boys' gangs, E. and S. Glueck (165, 166), and Healy and Bronner (169), in their extensive studies of juvenile delinquency, Blumer and Hauser (149), in their study of the motion pictures, and Zorbaugh (217), in his studies in the field of mental hygiene—all of these attributed to environment far greater powers for shaping character than the former writers. Sanders (198) also emphasized the power of environment.

The unqualified acceptance of either of these views by educators has often led to a fatalistic attitude. On the one hand there is the opinion that "strong" and "good" characters are born, not made; and on the other, the equally fatalistic concept that the individual, even with the aid of the school, can never escape to any appreciable extent the leveling effects of the great forces of the environment upon his moral development. It would seem that the antidote to such fatalism could be found in the concept that certain subfoundations of moral and immoral behavior are inheritable, but that certain environmental agencies which are not fully determined by invincible forces—including the home, the school, and the church—can care for the development of the young to the limits of his powers.

A third point of disagreement has been on the question as to whether educators should start with the individual or with the social order in their attempts to improve the character of youth. Not a few writers have taken the position that, since moral behavior is allegedly determined so largely by the stimulating conditions and the approved and disapproved acts in the social milieu, the main job in character development is to set up social, political, and economic conditions which are more conducive than existing ones to the development of desirable character. This view and its direct implication that the schools should be used to help usher in new adult social policies have naturally precipitated a sharp debate. Childs (157) ably presented the typical view of those who feel that the school should work for more immediate changes in the social order. He said that "all intentional education is a moral undertaking—moral in the sense that it involves working for one set of social ends and a definite type of personal character as opposed to others. . . . In spite of all that is said about social neutrality, the school . . . is not actually socially neutral. As long as the

school is content merely to make an exposition of various social alternatives and to commit itself to the advocacy of no positive social policies, it tends to throw its support on the side of arrangements and groups now in power."

Typical of the opposition are the views of Reisner and of Briggs. Reisner (196), arguing on grounds of history and governmental theory, stated that legitimate liberalism and academic freedom in the schools may suffer a decided set-back if the schools are used for radical propaganda. Briggs (152), also, saw grave dangers ahead if the schools set out to indoctrinate children in favor of some new economic or political order in adult society. "There is a vast difference," he said, "between the freedom that a scholar should and must have to declare the results of his investigations in the field in which he is competent and expert, and the freedom of any teacher, however biased his attitude, however erratic his judgment, to advocate in his classroom idiosyncratic ideas not yet substantiated by accepted facts or approved by the supporting public."

This issue more than any other has tended to divide the ranks of educators interested in character development. Experience in the field, however, does not indicate that practical education has reached the impasse which the arguments in this controversy might lead one to believe. Not all genuine and realistic work in the field of character and citizenship training among children leads to controversy over adult problems; and not all problems with controversial implications for adult society can be eliminated from study without introducing artificial barriers.

Genuine work has been done in Washington (145, 146), Denver (163), New Haven (175), and elsewhere with the enthusiastic support of the public. Hatch (168) and Jones (173) gave detailed examples of character and citizenship education where controversial topics naturally arose on the children's own levels of interest and comprehension, and where the teacher kept the study on the plane of fact finding and objective study of different proposals.

The above three issues—the nature of character, the relative strength of heredity and environment in character formation, and the instruction of the individual versus attempts to change the social order—have served to disconcert some educators, but their importance for stimulating thought and research and their significance for long-range planning in character education are very great.

Significant Areas of Agreement and Research upon Them

Probably the point which is reiterated more often than any other in discussions concerning character education in school is that the teachers hold the key position in the program, many writers maintaining that no program is any better or any worse than the teachers who carry it out. Stimulating articles which stressed the qualifications and possible contributions of teachers in character education have been written by Chase (155), Carlson (154), and Brown (153). Jones (173) obtained some evidence

indicating that certain teachers are much stronger in their influence with boys than with girls, and vice versa.

Closely connected with the importance of the teachers—and about as infrequently questioned by any one—is the importance of group morale in character education. This problem of group morale, however, has not received the research study which it deserves. Only one experimenter during the period reviewed has objectively studied its relation to moral development (173). Jones found that in a class where superior group morale developed, cheating decreased decidedly and cooperative behavior improved. Perhaps more striking than this was the finding that a few months after promotion, when the children of this class had been widely scattered in different classrooms, they had lost much of their gains. Indeed, this class lost more heavily than other classes which had made more moderate gains under less favorable conditions. The experimenter concluded that character gains in school may be group-linked, especially in the first stages, and that educators might profitably study ways and means of keeping classes which have developed superior group spirit as nearly intact as possible over several terms, in order that improved behavior, which is at first dependent upon the group for its appearance, may become habitual.

A third idea carrying more or less general agreement, but about which more objective results are needed, is that children improve in moral behavior best not through talk about character but through well-directed actions involving real choices. Whittaker (214, 215) particularly stressed this point and singled out for special criticism the wide use of trait concepts and codes in teaching. Franzblau (164), in an extensive study of Jewish children, found that acceptance of religious beliefs was not positively related to superior moral behavior. Jones (173) conducted an investigation involving eight seventh- and eighth-grade classes and extending over one school year. Two classes were taught by the first-hand-experiencing (or project) method without any discussion of meanings or principles; two were taught by the discussion method with no opportunity for experiencing; two were taught by the first-hand-experiencing-plus-discussion method; and two were held as controls. The pupils of all classes were tested at the beginning and again at the end of the training period on a wide battery of tests of actual conduct—the tests being mainly of the Hartshorne and May series. The main results of immediate interest from the point of view of methods of teaching were: (a) that the first-hand-experiencing-plus-discussion method was the only one which consistently yielded positive gains over the control groups, thus implying the importance of supplementing activities or projects with opportunities for the children to stop their "motor doing" from time to time and think through to meanings, generalizations, and applications; and (b) that the improvement in all trained groups was small, even in the experiencing-plus-discussion group. The experimenter interpreted this latter point as meaning that it is much more difficult than many believe to bring about improvement in the actual be-

havior of children of this age level by group instruction at school. One chapter in the book describing this experiment is devoted to a detailed description of the methods and teaching units employed.

Fox (163) described the Denver program of character education. Here the essential idea was the incorporation of character-developing activities wherever possible in both the regular and the extracurriculum program. No objective results were given, but the school officials, on the basis of experience, were convinced of the efficiency of the plan. Ballou (146) and Backus and others (145) described the Washington "demonstration" in character education. This was an elaborate, two-year program aided by federal grants totaling $150,225. It consisted primarily of the application in detail of an educational philosophy involving more attention to ethical instruction and to remedial, socializing, and guidance activities. No facts of a quantitative nature were given.

Pendry and Hartshorne (193) conducted a study of approximately fifty organizations which carry on recreational and character-building activities on a rather wide scale. In this study are many suggestions as to procedures which might be adopted for school use, particularly in its recreational program. Another study which stressed the opportunities for character development through club and recreational activities was that by Derrick, Fenton, and Partridge (160), on Boy Scout work in schools for delinquents. Clucas (159) wrote a stimulating article on the instruction of children in money management from an early age onward. To give children active experience in the use of money is the essential idea involved.

A fourth idea which heretofore has not been widely stressed, but one which seems to carry general conviction and is probably destined to stimulate much fertile research, is that character education should concern itself more with the motivation behind superior and inferior moral behavior. In other words, character education should be directed not at the removal of symptoms of moral maladjustment but at the conditions and urges back of such symptoms. Healy and Bronner (169), after many years' study of delinquent children, said: "The origins of delinquency in every case unquestionably represent the expression of desires and urges which are otherwise unsatisfied. For the onlooker, delinquency merely signifies misconduct; for the offender it is just as much a response to inner drives and outer stimuli as any other kind of conduct." Olson (190) stressed the point that in preparing plans of treatment for children with behavior disorders, whatever the type, recognition must be given to the fact of "multiple causation" and to the consequent necessity of a different approach with different individuals. Groves (167), in his discussion of cheating in school, stated that in any fundamental approach of this problem persistent efforts must be made to discover the "motives that impel dishonesty." He singled out the following as prominent factors leading to strain which in turn results in cheating: overemphasis on marks in school and home, the strongly conditioned attitude of children of "getting by," the overcrowding in

school leading to impersonal mass treatment, and the failure of the schools to adjust work to individual capacities and interests.

Factors leading to lying among children were considered by Fechheimer (162). He identified the following contributing factors: playfulness (lying in imaginary play, and to trick someone); fear (usually fear of punishment); compensation, for a feeling of inferiority or a desire for greater social success; and avoidance of something unpleasant. Weil (213) made an investigation of lying in school, using a group of 644 children. He reported that 23 percent of the boys and 21 percent of the girls lied in a spirit of camaraderie, 17 percent of the boys and 14 percent of the girls lied because of fear of punishment; roughly 10 percent of both boys and girls lied for convenience; and 6 percent of the boys and 21 percent of the girls lied "on account of vanity."

For other articles on motivating factors for ethical and unethical behavior see 147, 148, 166, 168, 171, 195, 204.

It is around the three controversial issues mentioned in the first section and the four areas just given that the main thoughts and researches of direct significance for character education seem to have revolved. There is, however, one other area of research having indirect bearing upon education in character which should be mentioned. It involves the development of measuring instruments for the objective measurement of moral behavior.

Progress in Measuring Devices

Keeler (176) made much progress in the development of the so-called "polygraph" or "lie-detector." It is designed to detect lying by recording changes in breathing, in rate and amplitude of heart action, and in the psychogalvanic reflex. Inbau (172) described a case in which indication of deception based on this instrument was admitted as evidence in a jury trial. Winter (216) reported good results with this type of device in detecting lying and theft among college students. Lyon (183) used the Larson "detector" with a rather high degree of success with juvenile delinquents.

Stephenson (201) and Kendig and Shevach (177) studied various perseveration tests and were convinced that such tests measure quite accurately a genuine character factor. Clark (158) worked with two tests of perseverance and obtained results which convinced him that these tests were measuring some psychological factor. Extensive use of several of the Hartshorne and May tests of conduct was made by Jones (173) who reported many intercorrelations and self-correlations. In general these correspond closely with the original results reported by Hartshorne and May in 1928-30. Van Alstyne and others (210, 211) developed a rating scale which included many items on moral behavior for use in measuring school conduct and attitudes.

General Discussions, Textbooks, and Summaries

In concluding this review, we come to the consideration of the rather large number of books and articles giving a general discussion of character

education. Our space allotment, however, will prevent more than a bare mention of the most significant of these. A good textbook for teachers and prospective teachers was prepared by McKown (184). Heaton (170) wrote a textbook on character development through recreation. Voelker (212) wrote a small book on the theory of character development. Whittaker (214, 215), in two articles, condemned the overuse of verbalization in character education and advocated learning by doing. Borgeson (151) argued for activities plus group discussions and named certain books which offer suitable student reading material to stimulate and enrich such discussions. Starbuck and others (200) prepared a series of three student textbooks supplying excerpts from biography for individual study and group discussion.

The main summaries and reviews which have appeared are as follows: Chassell (156); Jones (174); Maller (185); May and others (86); Myers (189); and Olson (191, 192).

CHAPTER IV

English Language

Harry A. Greene, with the cooperation of R. L. Lyman, L. J. O'Rourke, and Dora V. Smith

THIS REVIEW of the trends of method in elementary-school English as reflected by published contributions is based upon 67 books, monographs, and articles selected from those appearing during the period from July 1, 1934, to July 1, 1937. It may be that some contributions of a research character are unintentionally omitted. It is certainly true that not all of the titles to which reference is here made may be classified as research. Some are included because they express an important point of view, or summarize a significant tendency, without the support of systematically gathered, quantified objective evidence.

General Sources of Research Summaries

The preparation of this review has been facilitated by the appearance, during the period covered, of a number of very complete and helpful critical evaluations of research in certain related areas. In addition to those presented in the *Review of Educational Research* for February 1935, there are seven which should be mentioned here.

The Research Committee of the National Council of Teachers of English prepared a report which appeared in the *English Journal* (273). A critical summary of carefully selected research dealing with the teaching of elementary-school English was prepared by the committee in charge of the Second Annual Bulletin of the National Conference on Research in Elementary School English (222). A digest of unpublished studies in elementary English was prepared by a second committee in 1936 (261). A year later the Fifth Annual Research Bulletin of this organization contained a report entitled *Principles of Method in Elementary English Composition* (245). Sixty concise statements of method supported by research or consensus of opinion were summarized in this report.

The *Ninth Yearbook* of the Department of Supervisors and Directors of Instruction of the National Education Association (266) dealt entirely with the modern program in English. This yearbook reported excellent summaries of points of view, objectives, and materials based on subjective as well as objective evidence. A useful bulletin summarizing research dating over a considerable period, was published recently under the title *What Does Research Say?* (264). It was subtitled "a statement of the implications of educational research for teaching in the elementary school." One chapter gave helpful summaries in answer to specific questions on the teaching of elementary-school English and the language arts.

A summary of unusual value because of its perspective and point of view, was that reported by Bagley (220) in recent numbers of the *British Journal of Educational Psychology*. This was a well-annotated survey of the literature on the teaching of English.

Technics of Research

There is evidence of considerable interest in the development of research technics which seem to be peculiar to the field of English. The possibilities of using electrical recording equipment for the collection of oral language data, and of utilizing Hollerith tabulating machine equipment for the analysis of language skills were discussed in detail by Greene (246). Betts (223) reemphasized the superiority of the electric recording technic. A number of studies based on the analysis of children's language activities were completed during the period covered by this report, but since they were unpublished studies they were not listed in this summary. Significant use was made of recording equipment in the study of speech at the elementary-school as well as at the college level (251, 284).

The English Curriculum

Point of view—The selection and placement of subjectmatter units in the curriculum is definitely related to the educational philosophy current at the time. In the report of its Curriculum Commission, the National Council of Teachers of English (265) gave tangible expression to a certain point of view, and produced instructional materials which will undoubtedly wield a wide influence in the teaching of English. Barnes (221) threw doubt on certain current concepts of language teaching by emphasizing language as social behavior. This appears to be in line with the philosophy of the period.

Lack of progress in curriculum construction in English has been accounted for in three ways: (a) the complexity of the language itself, (b) the absence of adequate authority for the determination of the acceptable practices and usages, and (c) the difficulties involved in the identification of the basic skills (242). Some developments in each of these three phases of the problem offer hopeful signs for objectifying the curriculum. Pooley (270) pointed out the fallacies in the authoritarian approach to good usage and identified six levels of language usage which must be recognized. Much of English teaching aims at too high a standard and thus defeats its own purposes. To meet this difficulty, a helpful program of teaching was suggested. Canby (226) and DeBoer (232), discussing the results of research, notably that of Pooley (270), Fries (236), and O'Rourke (267), emphasized the importance of recognizing the fact that the final standards of correctness must be derived from the trends of usage, not from rules.

General content—The report of the Curriculum Commission of the National Council of Teachers of English (265) represented a useful con-

tribution to the problems of curriculum content and objectives. It was submitted as a pattern curriculum rather than as a finished product. In this report the curriculum is designed to provide pupil experiences with suitable subjectmatter to the end that individual language control may be developed through these experiences.

As an outcome of an extensive survey of language usage, O'Rourke (267) recommended the rebuilding of the English-usage curriculum to permit needed stress on the real essentials of expression. Hatfield (247) defended on logical grounds what is considered by some as an extreme form of functional or instrumental grammar as treated in the *Experience Curriculum*. McPherson (262) found further evidence of the need for more stress on the essentials in an analysis of errors in the writing of adults. Fitzgerald and Geoghegan (234) studied letter-form errors in 748 letters written by fifth-grade pupils and found that an adequate mastery of four elements of letter-form would have eliminated 87 percent of the form errors. In a later analysis of the data, these authors (239) reported an average of twelve to fourteen other language errors per letter. Many of these errors were the results of ignorance, while many were due primarily to negligence.

Creative writing—The practical value of a course in journalism in the elementary school was reported by Patterson (269). Contacts with outstanding journalists, visits to big newspaper plants, and responsibility for making and executing plans produced results far beyond expectations. Pupils may learn a trifle less about indirect objects, nouns in apposition, and gerunds, but the majority of the members of the class learned to express themselves coherently on paper.

The value of the close correlation of composition with other subjectmatter in the elementary school was shown very clearly in an experimental study reported by Gillett (240). In this instructional program the composition activities of the grade were centered around the social studies work. This appeared to result in an increased emphasis on, rather than a neglect of, the specific types of language skills identified and measured by standard and informal tests. The children showed ability to make more than the expected gains on the formal language skills, as well as to produce more than the average amount and quality of written work during the three years this program was in operation.

The importance of further curriculum emphasis on creative writing was pointed out by Certain (228). He stressed the need for the teacher to provide the children in creative writing courses with occasions (a) for spontaneous writing, (b) for inspirational writing, and (c) for systematic training in writing technics. An experimental study of the effect of environment on creative ability revealed a rather astonishing productivity on the part of the fourth-grade children studied, but failed to show any significant influence due to environment as evaluated by a socio-economic score-card (258).

Grade placement—The problem of grade placement is an extremely important aspect of research in the language curriculum. In the literature of the period no report of a genuine research attack on the problem was found. Cutright (230), in discussing this subject, pointed out that if individual pupils' needs are to be met, some of the current notions of the rigid grade placement of teacher activities must be abandoned. An increasing tendency toward the production of ungraded courses of study in the field of English composition is noted. This tendency is due (a) to the attempt on the part of educators to meet individual needs, (b) to the fact that English usage errors persist from grade to grade, (c) to the fact that each English usage is as important at one level as at another, and (d) to the fact that there are only a few studies of grade placement and these are not particularly helpful. The experimental work of O'Rourke (268) offered helpful suggestions in the arrangement of skills in proper sequence for effective instruction.

Vocabulary—The importance of vocabulary in language was recognized by a number of studies. Buckingham and Dolch (225) combined their own free-association list with eleven other vocabulary sources into a word list of great value for use in adapting teaching material to the word knowledge of children. Gates (238) compiled a list of 5,600 words from six sources and submitted each word to an evaluation in terms of interest and utility for the child, in terms of its appearance in the representative primary literature, and in the spoken vocabulary of the child. It was suggested that the use of such a basic vocabulary in reading, writing, and spelling would result in greater economy of instructional time and effort. J. H. Smith (276) compiled a vocabulary of 9,416 words from 2,711 papers written by children in Grades II to VIII on all types of elementary-school work. Four-fifths of this list was common to the Fitzgerald list.

Textbooks—The textbook is so highly related to the curriculum that studies in this field may properly be included here. Lawson (255), after making an examination of thirty-five texts for use in Grades V to VIII, inclusive, criticized the textbooks for their lack of recognition of, or agreement on, legitimate aims of instruction, and for consistent lack of agreement on important items of instruction. He concluded that textbook confusion involves as completely the matter of aims as it does the elements of content and method. In a study reported later (256), an analysis of fifty-three books further confirmed these conclusions. Dawson (231), in a study concerned primarily with the emphasis given to specific phases of composition and language usage, concluded that while recent textbooks attempt to provide enriching experiences as a basis for mastery, there is so much shifting in emphasis from one book to the next that it is obvious we do not know which phases should be most or least emphasized. In a search for progressive tendencies in sixth-grade textbooks, the same writer pointed out a year later that the neglect of spelling, and opportunities for motivating superior pupils, the non-functional nature of most of the

grammar, and the failure to make systematic inventories of the pupil's expressional needs, are serious deficiencies which will need to be supplemented by the teacher.

Methods in English

Two strong arguments were advanced for the teaching of composition in the situations in which it is actually used and needed: (a) the child is more interested because the situation is real, and (b) he understands the skill better when it is introduced in a real situation of which the composition itself is an integral part (241).

An experiment in withholding grades from theme papers until they had been revised and returned in corrected form seemed to operate favorably with junior high-school pupils (224). The experiment resulted in marked improvement in punctuation, usage, and sentence structure, and reduced the tendency of the pupils to work for grades. The modification of the Dalton plan was found to be effective in stimulating pupils to think, in acquiring effective habits of work, and in eliminating failure in two seventh-grade classes (235).

An experimental study (257) of the effect of sense training, literary models, and picture study led to the conclusion that sense training is most effective in improving the imaginative quality of descriptive writing. These qualities were improved when the pupil was given an opportunity to experience through the senses and at the same time was given training in vocabulary needed to express the experiences.

Specific motivation, consisting mainly in the instruction to each pupil to "improve your score," produced definite gains in scores on a grammar test at all age, grade, and mental age levels, according to an experiment with 534 pupils in Grades V to X (279). There is no attempt to infer that this motivation would prove equally effective in other fields with other types of material.

A number of specific and helpful suggestions on method resulted from a nationwide survey of English usage (268). Manuscript form was effectively taught through the use of graphic representations of form (237). It seemed to operate with equal effectiveness where the student used the typewriter, cursive or manuscript writing, blocked or indented form. In a study of the effect of the use of motion pictures on the composition ability of children from foreign language homes, it was claimed that the stimulation from the motion pictures improved the written compositions of the children (249). Eighth-grade children were found to respond so definitely to an opportunity to direct their own English activities that the program was expanded from one week to ten weeks of work. A significant result reported was the development of the ability of the group to set up well-defined practical goals and achieve these goals by concerted action growing out of individual effort (259).

Somewhat in contrast with this conclusion, Makey (263) found that pupils did not respond to an attempt to completely individualize instruction

in English. Many did not like to work alone and did not know when they were inadequately prepared to go ahead. Some learned to work very effectively. Hutchins (253) found that older and more mature students responded to opportunities to master interesting figures of speech. Handled properly, the study of figurative language opened to the student valuable opportunity for growth in picturesque expression.

The audience is a factor of importance in the preparation of a composition which the pupil must come to recognize if he is to communicate his thoughts effectively (227). Satisfying himself as the writer is only part; he must be convincing to his audience as well. The plan of training pupils unaccustomed to speaking by leading them by easy stages through a graded series of steps in appearing before a class offers theoretical advantages (278). While the objective evidences on this study were inadequate, observation of the children themselves indicated a beneficial effect through their loss of self-consciousness. The value of oral drill as compared with the grammatical approach was determined experimentally in two seventh-grade classes (229). The oral drill approach proved to be fully as effective as the grammar approach, although the former method as used in this study was in an experimental stage. The evidence suggested that the claim that the drill method is superior to the grammar method must be qualified by the statement that not just any kind of drill will prove superior under all conditions. No evidence was offered on the permanency of the results.

The teaching of English skills under conditions approximating those of actual work was found to be very important. Jenkins (254) pointed out that drill in which the pupil was forced to punctuate certain types of sentences but at the same time was obliged to do his own thinking and composition of the sentences was most effective.

As a result of an experimental project in the teaching of written composition in Grades VII, VIII, and IX, Ash (219) concluded that the mastery formula of teaching when applied to a unit type of curriculum, results in a great reduction in the amount of tiresome repetition of the same facts and principles year after year, and secures a higher grade of accomplishment than does the method of teaching with the well-learned cycles of subjectmatter.

Diagnosis and Measurement

The summary of elements contributing to success or failure in English presented in the Thirty-fourth Yearbook of the National Society for the Study of Education (275) is a valuable starting point for one interested in the problems of measurement in this subject. The problems of diagnosis and remedial work were stated and numerous areas of needed research in the measurement and diagnosis of difficulties in English were outlined. Schonell (271) pointed out that measurement in English composition has been of two forms: (a) composition scales, and (b) tests of technical elements, such as punctuation and sentence structure. Most scales have

neglected pupils' individual attitudes, characteristics, and experiences, and have given too much emphasis to form. A ten-category scale with a total of fifty points emphasizing thought, structure, and mechanics in the composition was proposed as a basis for diagnostic work.

Reports on new standardized tests developed during this period primarily for use in the elementary grades are limited. A group test designed to measure certain simple language skills and to test the pupil's actual knowledge about certain situations in the primary grades has been validated and standardized (272). The Iowa Every-Pupil Tests of Basic Language Skills have appeared in new forms yearly (243). A new test of the informational aspects of grammar has been standardized (244).

The use of written work in other subjects as the basis for the diagnosis of errors in English skills was recommended in a report of a recent study (277). The failure of the formal English skills to transfer to other written work was very obvious. Traxler and Anderson (282) investigated the reliability of an essay test in English. The reliability of pupil performance was found to be low, while in this experiment the reliability of the reading of English essay papers was high. Optimum conditions of testing and scoring undoubtedly prevailed. On the other hand, Duboc (233) found that many teachers were not equipped to evaluate children's compositions. Teachers' estimates were too often merely general impressions based upon no definite standards, or they were unduly influenced by some favorite point of emphasis. Healy (248) analyzed 175 sixth-grade compositions in an attempt to discover the factors which caused teachers to rate the compositions as excellent, average, or poor. Teachers could not make fine distinctions in merit. To teachers, form seemed to be much more important than quality in evaluating the compositions.

An interesting comparison of the achievement of Scottish pupils as measured by American achievement tests was reported by MacGregor (260). Tests in reading, arithmetic, language usage, and spelling were administered to 6,000 eleven-year-old children in Fife County, Scotland. Achievement tests and mental tests were also given to 1,300 pupils between the ages of seven and eleven in nine schools in the same county. In general, the Scottish "eleven-year-olds" were sixteen months ahead of the American norms. However, the American children were found to have entered school fifteen months later than those in Scotland. The language usage and spelling tests appeared to be somewhat too easy for the Scottish children. The purpose of the experiment was accomplished when the practical value of such achievement tests was demonstrated to teachers and administrators.

The true scope and nature of the vocabulary of the preschool child is not known. Uhrbrock (283) secured dictaphone recordings of approximately 24,000 words from a five-year-old girl representing reactions to her daily experiences. More than fourteen hundred and fifty words were used, of which 526 were proper nouns. That the study did not show the true extent of the vocabulary is indicated by the fact that 52 new words

appeared in the last thousand of the 24,000 words. It appears that language of the type recorded here is based upon a framework made up of a relatively small number of words arranged in many different patterns. As in other similar studies, an almost endless sampling is necessary to reach the limits of new additions.

Two attempts to measure the bilingual background of pupils were reported in the literature of this period. Tireman and others (281) discovered that Spanish-speaking children who spoke little or no English at the time of entrance to school, developed a median comprehension of 633 words and a median usage of 567 words out of a total vocabulary list of 650 words. He concluded that it appears possible to teach a much larger vocabulary than is ordinarily assumed, if specific technics are used. Hoffman (250) prepared a test called the Bilingual Schedule which was designed to reveal the foreign language background in relation to other factors such as age, grade, sex, reading ability, verbal intelligence, and non-language intelligence. The tests were given to 547 native-born children with at least one parent foreign born. Children nine to fifteen years of age in Grades V to VIII were used. The Bilingual Schedule appeared to furnish precise data on the effects of foreign language background on the individual's intellectual, moral, and emotional behavior.

Pupil self-appraisal as the basis for determining the relative difficulty of word meanings known by children was found by Tilley (280) to have an exceptionally high validity, particularly for word meanings in a setting of context reading material. Two types of long vocabulary tests, one in the ordinary multiple-choice type, and the other of the self-appraisal type were given to 326 third-grade children, 1,096 fifth-grade children, and 1,434 seventh-grade children. A difficulty score based on the number of pupils who did not know a word when administered by the two technics served as the data for the study.

The analysis of written compositions as the basis for a program of remedial teaching, and the determination of the teaching procedure most effective in eliminating pupils' errors was proposed by Humphreys (252). Good results appeared to come as a result of making the teacher aware of the types of errors most common for pupils of a given grade, and of the procedures found to be effective in removing the errors. No data showing the results of follow-up tests and the later analysis of compositions were given to support this claim.

CHAPTER V

Health and Physical Education

Ruth Strang, with the cooperation of Howard A. Lane and Edward A. Lincoln

Recognition of Complexity of Health Education

THE COMPLEXITY OF HEALTH INSTRUCTION is being increasingly recognized. The field of health instruction involves curriculum construction; methods of teaching that will insure the functioning of essential health information in the lives of children; the use of the health examination and, in fact, the entire school program, as opportunities for giving information and for developing good habits and attitudes; the use of community agencies for promoting the health of school children; and the preparation of administrators, teachers, and specialists for their task of health education. Emphasis on the integration of school health instruction with other aspects of school and community life appears to be the chief contribution of the literature of the period between July 1, 1934, and July 1, 1937.

Knowledge, skills, and technics in the field of health education are still incomplete and defective. This is due in part to the preoccupation of school and health administrators with other matters, to the lack of integration of health education with general education and psychology, and to the dispersion of responsibility among many groups—teachers, physicians, nurses, health officers, and others (353). A few significant researches, however, on the measurement of health and physical education, the relationship between health and other factors, the selection of essential health facts, and the methods of teaching health, have been reported during the period under review.

Tests and Measurements: Norms and Related Studies

With the rapidly growing acceptance of the concept of the school as society's most promising agency for guiding and fostering growth has come widespread interest in the development and use of methods for studying child growth. Studies in this area are being made in many university centers. Notable among them are the long-time programs of the universities of California, Iowa, Minnesota, Chicago, Columbia, Harvard, and Yale. In 1935 Lincoln (325, 326) described methods and results and some tentative conclusions of the Harvard studies. McGraw and Weinbach (330) and Bayley and Jones (289) produced films showing procedures for studying certain aspects of growth in infants and the development of motor behavior. McGraw's report (329) dealing with the development of erect locomotion seemed significant. Our knowledge of the motor achievements of young children has been enlarged by recent

studies of Goodenough and Smart (305, 306) and Wellman (364). These researches have significance in both methodology and content for the elementary-school years.

Factors influencing growth were extensively examined by Sanders (350) who made a strong case for environment as a potent determiner of growth and development. In drawing implications of the study of the rhythm of physical growth, Meredith (333) commented appropriately, "It is clearly evident . . . . that what is needed in this particular field is not so much the arduous collection of long series of repeated measurements of the same individuals as the development of satisfactory methods of handling such data once they are collected." To the reviewer it seems that much attention might be diverted from the search for norms and constants, to the discovery of significant variations and their meanings.

Krakower (323) summarized the development of testing in physical education. This field has developed from the height-weight norms, through attention to bodily types and variation, into the predictive value of anthropometric measures. McCloy (327) set forth the implications of anthropometry for meeting the health and educational needs of the individual. Marshall (332) showed the marked disparity in results secured by four currently used methods of describing physical status.

The establishment of standards of performance and measures of achievement in physical education continues to receive considerable attention. Daughtrey (300) presented carefully obtained norms of athletic skill for junior high-school boys. Cozens, Trieb, and Neilson (297) constructed scales of achievement in 45 athletic events based upon the achievement of 56,000 secondary-school boys. Cozens and Cubberley (296) insisted that classification methods used with secondary-school girls were without significance for college women. Driftmier (301) found neither age nor height to be useful in classifying college women for the more strenuous sports. Weight has some significance up to a certain point. Humiston (316) reported similar results in presenting what she found to be a useful classification test for women in sports.

The makers of tests of health knowledge appear to be changing from emphasis on knowledge of health practice only, to the inclusion of knowledges upon which sound health practices are based (302).

Relationship between Health, Motor Ability, and Other Factors

In this field we note the persistence, if not the revival, of interest in predicting motor skills and athletic achievement, which seems in many instances to be directed to rationalizing sports programs on the dubious basis of improving the functions of the human body. Beise and Peaseley (290) found the S-A-R (speed, agility, reaction time) test to distinguish between skilled and unskilled persons. The S-A-R scores did not respond to training. Korins (322) reported athletes to be superior to non-athletes in eye-hand coordination. Griffiths (308) secured a negligible correlation between mechanical dexterity, as measured by the MacQuarrie Test of

Mechanical Ability, and physical size. Factors influencing readiness to engage in strenuous sports were sought among 4,100 school children by McCloy (328). Age and weight were highly correlated with the results of tests of strength. In track and field athletics the age factor ceased to operate in boys at age seventeen.

The extensive investigation of Gafafer (304) presented data on the relationship of physical defects to general bodily growth. The concept of a general superiority seemed to be supported, but the valuable feature of the study was the summary of physical examinations of 30,000 school children from 21 states. Franzen (303) enumerated and described physical defects among children of New York City. Among more than ten thousand Detroit school children (Grades I to XII) visual defects were found to increase from year to year, myopia being most prominent. More girls than boys were so handicapped. Important correlations between visual defects and inferior school achievement, particularly in reading, were noted (342). These and numerous other studies point to the close relationship between physical defects and economic status of the children. Crook (298) presented further evidence that adult standards cannot be used for judging the posture of children. According to Ross (349), the difficult psychological adjustment of overweight children was due to improper procedures in physical education programs. Morsh (334) reported some superiority in deaf subjects in tests of bodily orientation through visual cues and of bodily control. In gathering data on the physical basis of stuttering, Cross (299) found stutterers not to be inferior to non-stutterers in unimanual activities, but definitely inferior in motor tasks requiring a higher degree of coordination.

Content of the Curriculum

Health content is inextricably associated with methods and psychology of instruction. The application of the best general psychological methods of instruction is futile if the content is not appropriate to the individual pupils. Curriculum content is not limited to verbalization; it includes all experiences that may contribute to the health education of the pupil. The best single summary of curriculum research in the field of health and physical education may be found in the volume by J. K. Norton and M. A. Norton (338). Of special interest is the emphasis on a curriculum based on the health needs of a particular group and developed cooperatively by them. The central problem of the health curriculum is: How do people learn to keep their bodies in good condition and avoid physical danger?

The approach to health content through a study of individual health needs has been repeatedly emphasized. A number of investigations relating to the physique of the school child summarized by J. F. Rogers (346) have important implications for curriculum content. A book such as Mangold's *Problems of Child Welfare* (331) contains facts about the conservation of life and health and recreation which suggest curriculum content. The special study of the crippled child (317, 358), the child with auditory

handicaps (311), and the child with visual defects (313) is necessary in order to plan a program for the handicapped. Still more technical investigations have sought to isolate certain physical factors such as interpupillary distance and depth perception (293), and eye-hand coordination (322) as possible factors in proficiency in ball games and other physical activities. Allen (285) discussed the possible relationship between the physical education program and the degenerative diseases, the after-school athletic program as an indirect means of reducing venereal disease, and the place of the corrective program in eliminating orthopedic defects.

Grout (309) demonstrated the building of a health program preceded by an intensive study of the local situation and developed cooperatively by committees of teachers with the assistance of school nurses, health officers, private physicians, and others whose advice was valuable. The tentative plans were tried and the most successful methods disseminated. O'Neill and McCormick (339) studied twenty-four-hour daily behavior of 3,512 boys and girls between the ages of four and thirteen years by means of two checklists, one filled out by teachers on the basis of their observation of two children and the other filled out by the children's parents. Representative groups of different ages, sex, intelligence, and home background were included in the investigation. Among the information so secured was the deficiency in sleep according to generally accepted standards, poor posture, and certain nervous habits. The deficiency in sleep was prevalent among all groups, poor posture especially characteristic of the dull groups, and nervous habits common to about one-fourth of all the children studied. This investigation was one of the bases on which a guide to the teaching of health in the elementary school (340) was prepared as a manual for teachers and local curriculum committees in studying their pupils, and in planning and carrying out programs.

The approach to health content through a study of individual and group interests was advocated by Bailey (288) who discussed pupils' interest in biographical and scientific material; Jackson and Alstrom (318) and Clevett (294), who found the activities preferred by boys to be basketball, hard baseball, swimming, football, volleyball, tennis, soft baseball, running races, skating, and soccer; and Waterman (362) who studied children's interest in rhythm.

Three areas of health knowledge stand out as essential: mental health, the newer knowledge of nutrition, and safety education (338, 355, 356).

Methods of Teaching Health and Physical Education

Health education in the schools is part of a larger whole which includes public health education and health education of professional groups. In general, school health education will be successful to the extent to which it permeates the community and the school and is based on the needs and capacities of the pupils.

Shepard (353) emphasized the fact that health information must not be confused with health education. It is the latter that moves to action

and eventuates in desirable changes in health habits and attitudes. The successful methods used in the health education of the public are suggestive for the schools. Among the most recent and effective features of public health education are: (a) the dramatized radio broadcasts prepared under the direction of the American Medical Association, the Chicago Health Department broadcasts, the Los Angeles weekly radio dramas based on actual occurrences; (b) the motion pictures dramatizing outstanding events in preventive medicine, notably the "Life of Louis Pasteur" and "The White Angel"; (c) museums of hygiene and health exhibits; and (d) popular health booklets. All of these methods of influencing health conduct appear to have been effective as judged by the response of the public to them.

"Health instruction may be given entirely as a separate subject, enriched through occasional correlation with other subjects, or correlated entirely with other subjects" (352). The present trend is to break down subject-matter lines and organize instruction materials from various sources around certain central themes. These health instruction units are developed cooperatively by pupils and teachers using the "map of values" prepared by experts as a safeguard against neglecting generally important areas of health instruction. Grout's compilation (310) of lesson units developed cooperatively for the first eight grades in rural schools was an excellent example of this trend in health education. Williams and Brownell (368) were not in favor of purely incidental health instruction. They recommended direct teaching of an expertly determined body of health content in a period allotted to this purpose. Consistent with this point of view is the need for information on methods and materials of health education such as that given in Williams and Shaw's text (367).

Six principles of health education generally agreed upon are:

1. The school should make possible and promote healthful living throughout the school day.
2. The best health possible for every child should be the objective.
3. One outcome of the health education program should be the child's understanding of health principles at his own level of comprehension.
4. The teacher is the key person in the health education program.
5. The school, home, and community must work together.
6. Social aspects of health should be stressed.

Health education as guidance is one of the newer emphases in methods of health education (357). J. F. Rogers (348) summarized the theory and facts about the physical condition of their pupils which all teachers in active classroom service should know. The physical education project described by Woody (370) made use of cumulative records. Health and physical education is essentially a problem of individual appraisal and adjustment and group solution of real health problems (315).

Fatigue enters into the discussion of methods of health education. For children of low energy, nothing that could be taught them between one and two o'clock would be so valuable as a rest period. Sutcliffe and Canham

(361), from an experimental study carried on in the Cambridge Training School, concluded that a lengthened school day of one hour, from 4:00 to 5:00 p. m., produced noticeable fatigue.

Recommended methods of safety education are demonstrations, dramatization, real experiences, motion pictures, lantern slides, and posters (356). Of these methods the use of real situations—learning through experience—was stressed by Brubaker (291) and Lacy (324); through art, by Welling and Collins (363); and through motion pictures, by Aurnhammer (287).

Suggestions for methods and organization of classes in a specialized part of the physical education program, namely, the teaching of stunts and tumbling, is given by Cotteral and Cotteral (295).

Whether special training in early years will develop a child's capacity beyond the level which would be achieved in the normal process of growth has not been extensively studied. Jersild and others (319) in a control-group experiment found some gain which might be attributed to practice, though not all cases showed statistically significant differences.

Health Service Programs

Palmer and Derryberry (341) analyzed the possible educational values which might be expected from a health service program: (a) for the child, "a favorable attitude toward professional medical and dental care," an appreciation of early medical service and of the dangers of sect-medication, information and advice specifically related to his health problems, and an appreciation of medical science; (b) for the parent, a better understanding of the child's health needs, information concerning community resources, and a favorable attitude toward all preventive health measures; (c) for the teacher, a better understanding of his pupils and their home conditions, improved knowledge of the meaning of certain physical symptoms, and better cooperation with other members of the school staff.

The major causes of lack of correction of physical defects appear to be failure to identify severe cases, and failure to follow the cases through the successive steps to the desired outcomes. Parents are less to blame than the school health program and the personnel involved in that program. As a positive program, it is proposed that (a) the volume of examinations and selection of defects should be guided by the corrective services available; (b) the examinations of possibly serious defects should be more accurate and thorough; (c) the nurse should have substantial and convincing evidence to give to the parents; (d) records should show progress made in correction (286, 344).

Williams (366) described the educational functions of the school physician, nurse, and other specialists in health education. Whitney (365) outlined the reciprocal relationships between the nurse and the teacher with reference to the health of the child. Sullivan (359) found a variety of practices reported on his questionnaire by superintendents of about twenty representative schools.

The majority of responses to a questionnaire sent out by the Joint Committee on Health Problems in Education (336) to representative school administrators and physicians indicated that the school health department should take the major responsibility not only for health instruction but also for periodic health examinations, of pupils and teachers, treatment of injuries incurred at school, and cooperation with community agencies.

A number of other problems of administration of health and physical education were discussed by Smiley (354), H. A. Jones (320), Chenoweth and Selkirk (292), Harmon (314), and Sharman (351). In all these articles the comprehensive view of health education and its interpenetration with other aspects of school and community life predominates.

An Outstanding Experiment

The most important experimental attempt to study the effects of a health education program was reported fully by Hardy and Hoefer in their book, *Healthy Growth* (312). In contrast with the scope and elaborate statistical treatment of the data in this research, previously published descriptive accounts of health programs appear obviously inadequate in their evaluation on the basis of subjective opinion or quantitative study of only one or two outcomes. Health educators have long recognized the need for experimental work in natural school situations, but have been deterred, perhaps, by the difficulty and complexity of the problem. The present research is presented as a longitudinal control-group experiment beginning in Grade III and extending over twelve years. More than two hundred pages of quantitative and qualitative data were collected for each of the 407 children studied. The experimental group followed a program including health examinations, health instruction in the classroom, extensive contacts with child specialists, and follow-up by the school nurses of recommendations made by the pediatrician. The control group had the same health services, but no special classroom instruction, while the small "transferring group" had limited contacts with all phases of the program. Statistical comparison is made, using first the total number of cases, and then paired cases.

Among the multiplicity of specific results reported, the improved physical condition of the children in the experimental group stands out most unequivocally. The pupils who had participated in the entire health program were superior to the controls in general physical condition, nutritional rating, firmness of muscle, posture, muscular strength and vigor, and number of defects corrected. This superiority of the experimental group, however, cannot be attributed to the classroom health instruction alone. It is a resultant of the other features of the program and, to some extent, of the special characteristics of the groups. This truly stupendous piece of work is weakest in its major problem, namely, the influence of *instruction* on health and development. In spite of every statistical effort to correct for initial non-equivalence of groups in respect to such important factors as

family background and intelligence, the results are not convincing. The investigation emphasizes the importance of setting up, if possible, groups that are comparable with respect to the factors that are most likely to influence the physical development and educability of the pupils.

Even though conclusive evidence of the effectiveness of the health instruction was not secured, this research has made an invaluable contribution by developing more precise methods of measurement, by analyzing the process of appraisal of children's health, and by frankly calling attention to sources of error in the experimental technic. The fullest possibilities of the original data are still unexhausted. If the wealth of data already collected were reassembled as case studies, individual growth curves could be plotted and patterns of health behavior and status could be studied with reference to the environmental conditions associated with them.

Preparation of Health Educators

Although slight progress has been made in developing experimentally sanctioned specific methods of health instruction, three factors have been emphasized which play important roles in the total program of health education. These are (a) the attitude of the administrator, (b) the preparation of the teacher, and (c) cooperation with community agencies.

The attitude of 2,000 administrators was studied by means of a questionnaire sent out under the sponsorship of the Metropolitan Life Insurance Company (369). All but 4 percent of these administrators recognized the need for specialized courses in school health education to be given in summer schools. They demanded, in general, courses that were detailed, specific in their make-up, and based on the experience and accepted practice in good modern schools. The education of the administrator is a strategic point of attack because it is the administrator who exerts leadership in health education in his school system, coordinates the health activities within the school and between the school and community agencies, and who is responsible, more than any other one person, for creating a healthful school environment.

The education of the teacher, according to J. F. Rogers (347), should include the fields of sanitation, pupil inspection, and health instruction. The preliminary report of the Subcommittee on the Educational Qualifications of School Health Educators (85) included in the proposed professional education of teachers and supervisors of school health: (a) scientific education—physiologic hygiene, community hygiene, public health administration; (b) special methods and materials in health teaching, special health problems and needs of the child, healthful school living, school health service; (c) pedagogical and cultural content; and (d) practical experience.

How "to arouse concern in school authorities regarding the physical condition and future health behavior of the school child" is a more difficult problem than merely giving teachers information. A particularly successful experiment in teacher education was carried on for several years in

the province of Ontario, Canada (343). The first move was to bring the normal schools and the field in close contact by sending members of the health department into the normal schools to give supplementary lectures on hygiene and physiology. The second move was to study new trends in health education, and the third step was to demonstrate a program of health teaching in sixty-one classrooms. A summer course in health teaching included a thorough health examination for each teacher, observation in a demonstration school, study of community enterprises such as milk plants, water system, etc., and follow up of each teacher the following winter in his classroom.

Among the modern trends in physical education mentioned by J. E. Rogers (345) are better trained teachers, increase in time allotment, better curriculums, and increase in adequate facilities for physical education program. Nash (335) discussed various phases of the training of teachers in the field of physical education.

Further Research Needed

There is obviously a dearth of scientific research on important problems of health and physical education. "There are doubtless many who are trained for the study of these problems, but we have not created a sufficient demand for research in school health education" (369).

Four major lines of investigation are here suggested.

1. Research on the direct health aspects of the school environment—the health examination, correction of defects, nutrition, heating, lighting, ventilation, seating, disease control, physical activities, and mental and emotional health.

2. Research to ascertain the facts that are accurate and essential to healthful living, in general, and in various local situations.

3. Research on the most effective methods of health education—how, for example, to establish good attitudes toward washing the hands before eating, and habits of doing so.

4. Research on administrative aspects of health and physical education—how school and community health may be integrated and how administrators, teachers, and specialists should be prepared for, and should function in, meeting the health needs of children.

CHAPTER VI

Music

Earle Connette, with the cooperation of James L. Mursell

THE LITERATURE of elementary-school methods in music and psychology may be divided into three classes. First, and most numerous, is the essay-type of article *about* the field, often based upon individual opinion, or upon observation of a few cases. Second, there is a smaller category of material which contains much valuable information, including objective data, but which cannot be considered as research in the full sense—perhaps because it does not bear upon a real problem. Last, decidedly in the minority, is the genuine research contribution, which adds to the basic knowledge of the field. Articles of the first type have not been included in the present chapter or its bibliography.

Bevins (371) discussed the objectives of music education and gives an excellent eclectic list of suitable materials. The use of syllables was vigorously upheld by Bryant (372) who showed them to be of value in developing true musicianship and performance skills. Canfield (373) reported a study in which an experimental group, engaged in composing and musical notation for a part of the class time, excelled the control group in a variety of criteria at the end of nineteen weeks. Basic principles were outlined and discussed by Connette (374) for the sequential progression of music education from kindergarten to the junior high school. Fullerton (375) discussed the technic of the "choir plan" of teaching elementary-school music. An argument for emphasizing the emotional side of music was made by Graham (376). The many-sidedness of eurythmics was shown by Hall (377) to turn on its value as a tool in reaching and benefiting different types and degrees of mentality.

That achievement in singing is retained over a period of two years was shown by Jersild and Bienstock (378). The well-balanced program in the elementary school was outlined by Johnson (379). Kwalwasser (380) reviewed and summarized several research studies which treat both the psychological and pedagogical aspects of elementary-school music education. The essential functions of the Prediction and Guidance Program in the Rochester, N. Y., public schools were revealed by Larson (381). Maclary (382) struck at an important issue in regard to classroom attention and concentration. A report of the ways the integrated program in the elementary schools at Superior, Wisconsin, was made successful was given by McLean (383). In one article, Mursell (385) gave a presentation of the principles elementary-school music teachers may employ in attaining the desired ends of music education. In another he (384) emphasized those essentials necessary to make elementary-school music benefit all children to the maximum degree.

The Research Council of the Music Educators National Conference (386) reported the first steps they have taken in the making of the new course of study. Perham (387) pointed out the importance of physical and psychological environment and how it was set up in the Ohio State University Elementary School. Pond (388) contended that students should feel the inherent interconnections of life and all great music so that they may have that real social consciousness which men must have if the spirit of man is to grow. Rosenthal (389) discussed music appreciation in a manner which purports not so much the revelation of new thought and procedure but rather a reflection of the viewpoint and experience of a teacher in a private elementary school for boys. Samuelson (390) admonished music teachers to develop the creative period of American music through the public schools and outlined a program showing how to do it. Thorn (391) showed the place of singing and rhythmic activities in the kindergarten. As a bit of advice and assistance to music teachers who find difficulty with music in an informal elementary-school curriculum, Whalen (392) made some excellent suggestions based upon experience in the New York City public schools.

CHAPTER VII

Reading

William S. Gray, with the cooperation of Donald D. Durrell, Arthur I. Gates, Ernest Horn, and Paul McKee

Procedure—This section summarizes the contribution of scientific studies to our understanding of the psychology and methods of teaching reading in elementary schools since July 1934. The plan adopted in preparing the summary corresponds closely with the procedure followed in preparing a similar report for the *Review of Educational Research* for February 1935. The bibliographies on reading published annually by the writer (433, 434, 435) covering the period from July 1, 1934, to June 30, 1937, were first checked for completeness by Durrell, Gates, Horn, McKee, and Yoakam. The references in these bibliographies which related to the psychology and methods of teaching reading were then collated. A summary for this chapter was prepared in preliminary form and submitted to the various members of the committee for this chapter to get their criticisms and suggested revisions. The manuscript embodying these suggestions was submitted to Gates and then returned to the writer for final approval.

Reading Readiness

During the last three years increasing recognition has been given to the importance of adequate preparation for beginning reading. Evidence of this trend is found not only in the adjustments which are being made in instruction in the kindergarten and first grade, but also in the increasing number of investigations which have been reported in this field. The most comprehensive discussion of related problems which has appeared is that of Harrison (437) who summarized the results of studies and expert opinion concerning the factors influencing reading readiness, the types of instruction which foster it, the measurement of reading readiness, and the remedial program.

The fact that first-grade pupils differ radically in their preparation for reading and in the ease with which they learn to read was emphasized repeatedly by such investigators as Arthur (393), Boney and Agnew (399), Gates (428), Gates and Bond (429), Harrison (437), Monroe (451), Witty and Kopel (489), and others. The evidence presented showed clearly that those who possess the greatest amount of "reading readiness" make most rapid progress, as a rule, in learning to read. Investigators differ, however, in their opinion concerning the best course to pursue in the case of those who are not ready for reading at the time it is normally introduced into the school curriculum. For example, Boney and Agnew (399), Thomson (465), and Yageman (496) maintained that reading should be

postponed for some pupils until they have acquired greater maturity and experience that prepare for it. On the other hand, Gates and Bond (429), placed major emphasis upon the importance of "recognizing and adjusting to individual limitations and needs before and after the beginning of reading rather than merely changing the time of beginning reading." One reason for such differences in recommendations lies in the fact that most investigators assume that all initial reading activities should conform to the same general pattern. It is obvious, however, that questions relating to the time at which reading should be introduced cannot be answered accurately without considering the nature and types of reading in which pupils should engage.

The factors which influence reading readiness have received wide consideration. Harrison (437) classified them under three general headings, namely, intellectual, physical, and personal development. "Of major importance among all the factors are those of (a) adequate mental age, (b) good vision, (c) good hearing, (d) emotional stability, (e) adjustment to the school situation," also seven abilities that are acquired through appropriate preparatory training. Harrison's summary has been supplemented by the results of several studies of various factors. Fuller (427) found that those who had received special language training in the kindergarten "achieved greater success in reading in the primary grades than those pupils without such training." Wilson (481, 482) studied the correlation of vocabulary knowledge and range of information with the results of reading tests in the first grade. The coefficients were not as high as the investigator had expected, being .31 and .33, respectively. Gates (428) studied the necessary mental age for beginning reading in a number of groups "which were taught by appreciably different methods and materials." The evidence secured led to the conclusion that "the age for learning to read under one program or with the method employed by one teacher may be entirely different from that required under other circumstances." As a result of such studies it becomes increasingly clear that the influence of specific factors must be studied broadly before final conclusions can be reached concerning their relationship to reading readiness. The validity of this view is further supported by the findings of Arthur (393) who found that some pupils make no more progress in reading in two years than other pupils of the same mental age make in one year.

The possibility of predicting success or failure in beginning reading has been studied by Monroe (451), Woolf (493), and by Wright (495). Monroe presented evidence based on records from 85 six-year-old first-grade children in four IB grades. The correlation between reading achievement near the end of the year and the total percentile score on the Monroe Reading Aptitude Tests was .75. Woolf compared the intelligence scores of kindergarten children with their reading scores in the first grade and found that intelligence tests are not good prognostic measures of progress in reading. This condition does not harmonize with the findings of many investigators and raises questions concerning the validity of the measures

used and of the teaching procedures adopted. Wright correlated five predictive measures with success in reading in a two-year study involving approximately 400 beginning first-grade pupils. The measures used were the Metropolitan Readiness Test, a pupil rating scale by which pupils were rated by their first-grade teachers, the Detroit First Grade Intelligence Test, the Lee-Clark Reading Readiness Test, and chronological age. All measures, excepting chronological age, correlated significantly with reading achievement, the first two measures as listed above producing the highest correlations. Such findings indicate that success in reading may be predicted with fair accuracy and should stimulate further effort to refine measures of reading readiness. The statement should be added that the tests of greatest predictive value are, as a rule, measures also of early stages of reading achievement.

Evidence of the value of training and experience which prepare for reading was reported by Petersen (457) and by Wilson and Burke (483). Their findings indicated not only more rapid progress in the mastery of the mechanics of reading but also greater interest in reading activities than was formerly true.

Relative Merits of Manuscript and Cursive Writing in Teaching Beginning Reading

The results of previous studies of the relative merits of manuscript and cursive writing were reviewed by Cutright (404). The evidence presented justified the conclusion that manuscript writing may be introduced to advantage in the primary grades "because it is a distinct aid in learning to read." This conclusion is supported by the results of earlier studies. The evidence presented by Cutright also indicated that manuscript writing may be of greater assistance than script in learning to spell and in expressing ideas freely. This interpretation, however, is not supported by the results of a recent unpublished study.

Value of Phonics in Learning To Read

The value of phonics as an aid in learning to read continues to challenge the interest of investigators. In a controlled experiment which continued for eight weeks, Tate (463) studied its influence on progress in silent reading in Grade I. The instruction given was provided in a special period. The results revealed distinct advantage in the use of phonics, but showed clearly that the use of extended periods for such purposes was wasteful. Tate concluded that phonics should be used by the pupil as a tool and "not as subjectmatter to be mastered for its own value," that "overemphasis on phonics hinders rapidity and thoroughness of comprehension," and that regular periods for phonic drills are not desirable. These findings harmonize with recent trends in the teaching of phonics as summarized by Dickson (409) who analyzed the contents of eighteen manuals of readers. Her study showed that "there is a clearly defined tendency to keep phonics subordinate to the meaning in all reading but at the same time to recognize

the need for phonetic analysis and the value to be derived from wisely conducted phonic instruction." As pointed out in the Thirty-sixth Yearbook, Part I, of the National Society for the Study of Education (453), it would greatly clarify thinking if such terms as *word recognition, discrimination,* and *analysis,* could be adopted in place of phonics and phonetic skills.

Effect of the Typewriter on Beginning Reading

The proposal to use the typewriter in promoting progress in reading among young children has received serious consideration during recent years. Unzicker (475) carried on a controlled experiment involving ten first-grade classes to determine the effect of the use of the typewriter on beginning reading. The results "indicate a trend of slight but constant superiority on the part of pupils who used typewriters." They showed also that children of low intelligence profited most from their use. In a report which summarizes the findings of several studies in this field, Haefner (436) concluded that the typewriter exerts a favorable influence, contributing to clearer visual word perceptions in the primary grades, and to better comprehension in both the primary and the middle grades.

The Development of Word Recognition

One of the most challenging problems in teaching beginning reading relates to the development of efficient habits of word recognition without distracting attention unduly from the content of the passages read. As a step in securing a better understanding of the problems involved, several investigators have recently made specific studies of the nature and development of habits of word recognition. Hildreth (440), for example, followed the daily experiences of a child in learning to read and was impressed "with the ease with which he learned words of a pleasant emotional tone and the difficulty he experienced with words representing things feared or hated or words describing situations over which deep seated emotional complexes might have developed." The statement should be added that Hildreth's investigation was concerned with a number of factors, other than mere word form and word length, that are involved in learning to recognize words, such as familiarity, ease of pronunciation, and pleasantness of association. Hill (441), in a study of the process of word discrimination among pupils who were learning to read, found among other items that "the beginnings and endings of words were most frequently observed and used as cues," that "the middle section of the word was seldom observed and therefore gave rise to most errors," that "single non-reversible letters were distinguished quite adequately when presented in isolation," that "the larger the proportion of identity between two words, when configuration was considered as one aspect of identity, the more confusing the two words were."

The foregoing contributions may be supplemented by the results of studies involving children at different age levels. Davidson (406) com-

pared the efficiency of kindergarten and first-grade children in recognizing confusing letters, such as b, d, p, q. The results showed that a larger percent of kindergarten than first-grade children made every type of error. "Practically all kindergarten children confused d with b, p with q, and b with d. A smaller but substantially large percent of first-grade children made similar errors." Frank (425) compared the recognition habits of children who were backward in reading with those of beginners in the infant school and concluded that "the mode of perception of the backward reader has remained on the same level as that of the young child." Obviously the nature of the guidance in word recognition required by the seriously retarded reader differs little from that of the child who is just beginning to learn to read.

That significant growth in word recognition may be achieved during the first grade was shown clearly by the findings of Donnelly (413) who measured progress in vocabulary mastery at frequent intervals throughout the first grade. Her data showed also that the range of achievement increased rapidly after the third month in school, that third month word recognition scores showed a correlation of only .57 with ninth month scores, and that girls were superior to boys at all testing periods. The reasons for significant differences in rate of growth among children in general and between boys and girls merit further investigation.

Undoubtedly the materials and methods used influence both the rate of growth in word recognition and the nature of the habits involved. As a result of tests based on the primers used in first-grade rooms of two groups of schools, Dolch (410) discovered wide differences in vocabulary mastery. Inasmuch as many conditioning factors were involved, entire responsibility for differences in the achievement of the pupils should not be attributed to differences in the primers used. The influence of method in developing habits of word recognition was illustrated in a study by Hill (441) who found that although the training provided reduced the number of errors which the children made, it tended "to pull the attention of the children more and more to the beginning of the word." Such findings indicate that teachers and school officers should study carefully both the materials and methods used in developing word recognition and should determine accurately their influence on the reading habits and the progress of children.

Adequate Meaning Vocabulary and Methods of Expanding It

The importance of systematic enlargement of the meaning vocabularies of pupils was emphasized by Thorndike (466) as a result of elaborate vocabulary studies, particularly at the middle-grade and junior high-school levels: "By the time he [a pupil] leaves Grade 9 he should know from 10,000 to 25,000 word-meanings, a large fraction of which he will learn from reading, not hearing." Dolch (412) secured evidence which indicates that children entering school have a vocabulary of about 2,700 words on the average. It is obvious that teachers face a challenging responsibility in developing an adequate meaning vocabulary by the end of the elementary-

school period. As one means of expanding the child's vocabulary, Thorndike recommended wide reading of material which introduces new words gradually. He also discussed the advantages and limitations of teaching words in isolation and in context.

As a means of helping to determine the relative difficulty of word meanings, Tilley (468) summarized data secured from several hundred children in each of Grades III, V, and VII, through the use of multiple-choice and self-appraisal types of tests which present words both in isolation and in context. His findings indicated a high degree of reliability for the self-appraisal technic. The fact should be pointed out that his findings in this connection do not harmonize closely with the results of several earlier studies. It is possible that the specific technics employed represent a distinct improvement over those used earlier. To the extent that self-appraisal methods are valid, the teacher has at her command a ready means of determining the words whose meanings are not clear to pupils.

Issues Relating to Oral Reading

In harmony with the increased interest expressed recently in the place and value of oral reading in the school curriculum, a number of studies relating to oral reading were reported during the last three years. McDade (446) questioned the value of using oral reading in beginning reading classes. His views were based on the assumption that the habits of vocalization thus established interfered with speed and comprehension in silent reading. In an effort to demonstrate the value of non-oral reading methods, he conducted an experiment among three first-grade classes using different methods—a non-oral reading technic, an oral reading technic in which phonics was emphasized, and an oral reading method in which phonics was not emphasized. Records of achievement in reading at the end of the year were favorable to the non-oral reading method. "The mean reading score exceeded the mean mental age expectancy." The report did not indicate the extent to which various important variables were controlled or held constant. That the use of some oral reading is valuable, particularly in Grades II to VI, inclusive, was suggested by the results of an experiment by Kirby (444) which indicated that a combination of silent and oral reading methods is more efficient than exclusive emphasis on silent reading. Obviously further experimentation is desirable at different grade levels under conditions which are comparable.

The significance of difficulties in oral reading is widely recognized. Duffy and Durrell (414) reported the difficulties of 87 third-grade children under eighteen categories of which the six most frequent were: ignoring punctuation; habitual insertion and omission of words; inaccurate guessing; errors on small words; poor enunciation of difficult words; and inadequate phrasing in reading. Wells (480) reported for pupils from nine to twelve years of age what he termed needless reading errors; that is, those spontaneously corrected or "corrected upon merely being told that an error was made." Both groups of investigators emphasized the need of

detailed studies of the causes of such errors and of constructive steps to correct or eliminate them. As a means of studying the nature of errors and difficulties in oral reading Tiffin (467) recommended simultaneous records of eye-movements and the voice in oral reading.

Factors Influencing Speed of Reading

Because of the great importance of speed of reading, investigators have been interested for many years in the factors which influence it favorably and unfavorably. As a step in the further study of this problem, Burk (401) gave tests to 1,800 fourth-grade pupils. The specific problem in which she was interested related to the influence of factors in style of composition on rate of reading. Her data showed that stories written in short simple sentences are read more slowly than stories containing long complex and compound sentences. Furthermore, "stories written in direct conversation or play form seem to produce the highest rate scores. Those containing indirect conversation tend to produce the lowest rate scores." Preston (459) found that the rate at which familiar and unfamiliar words are perceived are related to speed of silent reading among the college students tested. "The relation is closer for unfamiliar words." Trimble and Asperger (474) also found that good readers at the third-grade level recognize words more quickly than poor readers, also that the span of recognition is wider. In general these findings harmonize with the results of previous studies.

The Improvement of Comprehension

Because of the very great importance of good habits of comprehension, it is encouraging that investigators are undertaking studies concerning its nature and the factors which influence its development. Dewey (407), for example, compared the ability of 140 pupils to secure facts and to do inferential thinking concerning the historical material read. His data led to the conclusion that "pupils cannot be trained to read with understanding merely by being trained to search for facts as they read." The development of a "true understanding of what is read" is of far greater social significance and presents the broader challenge.

With respect to the factors which influence comprehension, Dewey (408) found that "children in the eighth grade do not seem to possess sufficient backgrounds in the various fields to enable them to interpret intelligently what they read." Young (498) found that general language effectiveness as indicated by ability to understand what is presented orally is an important requisite to good comprehension in the middle grades. Goodykoontz (431) carried on experiments among middle- and upper-grade pupils which showed clearly that "pictures in textbooks supply background and provide vicarious experiences which add to the understanding of textual material." Burk (401) secured evidence from fourth-grade pupils which shows that stories containing direct conversation are much easier to understand than stories containing indirect conversation. In the

case of factual material, Engleman (420) found that the use of the conversational style was preferred by fourth- and seventh-grade pupils and that the content presented was retained slightly better. Nolte (456) studied the effect of simplifying the vocabulary on comprehension of sixth-grade pupils. The evidence secured led to the conclusion that there are "no statistically significant differences between comprehension of selections in the original form and those read with reduced vocabularies." Since numerous investigations show clearly that vocabulary mastery is closely related to comprehension, the need is urgent for a clear definition of the types of vocabulary changes which do affect comprehension.

Very little has been reported recently concerning the most effective methods of promoting growth in comprehension. Cohen (402) presented the results of a comparative study of the value of extensive and intensive reading in improving reading ability in the upper grades of an occupational school. The results were inconclusive, however, and led to the recommendation that the study should be repeated.

Work-Type Reading and Study Habits

A clear recognition of the importance of reading as an aid in study has directed the attention of investigators to the so-called "work types" of reading. The character of the studies which have been made in this field is well illustrated by a summary prepared by Yoakam (497) of research work done at the University of Pittsburgh. Specific problems investigated related to such topics as what pupils do when they study, the study patterns followed in trying to prepare assigned lessons in history, and the mental steps involved in trying to assimilate ideas from the printed page. Interest in this general problem was further illustrated by an investigation by Cuff (403) who attempted to identify the study habits of pupils in Grades IV to XII, inclusive. Two significant findings were (a) "bright, young, and superior pupils in every grade have quantitatively (17 percent) more helpful study habits than do others"; and (b) "methods of study apparently crystallize in the elementary grades and do not as a rule improve appreciably thereafter." Another possible interpretation is that the secondary school is failing to develop improved reading and study habits comparable to the increasing age and maturity of pupils. Evidence which justified increased attention to reading problems was reported by Finck (424) who found that specific effort to improve reading ability was accompanied by greater achievement not only in reading but also in those subjects which involve a great deal of reading.

Effect of Improvement in Reading upon Intelligence Scores

The fact has long been recognized that reading achievement is conditioned in part by the intelligence level of the pupil. The effect of improvement in reading ability upon intelligence scores has not been so widely studied. Scruggs (460) secured evidence in a study of 202 pupils of the fifth grade in six negro elementary schools which showed that im-

provement in reading ability affected the intelligence status of the learner. In explanation of his findings he stated: "The intelligence quotient is constant only so long as the conditions under which a pupil lives are constant. Changes in the conditions may make changes in the pupil's mental status." This is a very encouraging interpretation and points to broader functions which schools may serve. Hawthorne (438), who studied the same problem among white pupils in Grades V to XII, failed to find that intelligence scores increased with improvement in reading ability. This is somewhat surprising in view of the fact that the intelligence tests used involved reading. Hawthorne did not indicate the nature of the training in reading which was provided. The notable difference in the findings of the two studies suggests that it may be possible to improve reading achievement as measured by a standardized test without affecting in any significant way the readers' scores on an intelligence test.

Provision for Individual Differences

The fact that pupils differ widely in reading achievement and in the rate at which they progress is emphasized in many of the studies referred to in this summary. The results of experiments to determine the value of adjusting instruction to the varying needs of pupils are less frequently reported. Boney (398) determined the months of progress made in reading by fourteen pupils who failed that subject in Grade I and who were given instruction at their own levels in Grades II, III, and IV. The results were gratifying and led to the conclusion that a large proportion of slow and backward pupils can, by the end of Grade III, fit into an average fourth-grade group, if appropriate instruction has been provided.

As a result of studies carried on in Grades III to VII, inclusive, Worlton (494) concluded that individualizing instruction in reading provides better opportunities than traditional procedures for bright, normal and slow pupils "to learn to read and to read to learn." Postel (458) found that seriously retarded pupils made more than the normal amount of progress, particularly in paragraph meaning, as a result of adapting reading materials to the needs of pupils. The practical implications of such studies are clear and have wide application. As a stimulus to constructive effort in this field, Durrell (415) discussed at length some of the problems which merit careful consideration in providing for individual differences.

Interests in Reading

A knowledge of the reading interests of children is of large importance both in providing appropriate materials for basic instruction in reading and in establishing permanent habits of independent reading. It is not surprising, therefore, that a wide variety of studies has been made in this field during the last three years. For example, Seegers (462) secured information concerning the "undirected, uncontrolled reading of books done outside of school hours by 924 pupils of a city school." MacLatchy and Beavers (448) provided stimulating opportunity for a sixth-grade class

to read for enjoyment, and recorded the amount of reading done, and studied its influence on reading achievement. Hockett (442) attempted to determine the types of books "most widely read and best liked" by 500 boys and girls in Z sections of Grades IV, V, and VI in seven schools. Witty and Lehman (490) reported findings not previously published of their investigation of the reading interests of gifted children. Broening (400) made a study of the library reading of over eleven thousand pupils in fifty schools of Baltimore.

It is impossible here to summarize all the significant findings of these studies. For a detailed survey of the results of studies of reading interests, reference is made to the report of Friedman and Nemzek (426) who summarized the findings of 38 investigations. In general, the studies referred to above show that children read widely when stimulating opportunities are provided, that the interests of pupils at the same grade or mental level differ notably, that interests change from one grade level to the next, and that reading interests may be cultivated or redirected through proper guidance. Furthermore, the studies of gifted children indicate that they spend more time in reading than do unselected groups, that sex differences in reading interests are comparable to those of unselected groups, and that gifted children reveal a tendency toward a concentration of interest in favor of fewer types of books.

Reading Abilities of Pupils of Different Nationalities

The influence of nationality on progress in learning to read English has been studied objectively at frequent intervals during the last three decades. Most of these studies have been concerned with the relative achievement of pupils of different nationalities whose age or grade classification was the same. Of a somewhat different character is a study by McElwee (447) who compared the records of 600 Jewish children in ungraded classes "with an equal number of Italian children of the same mental age." The mental ages of both groups varied from five years, six months, to nine years, eleven months, on the Binet Examination. "The outstanding difference was that 6 percent more of the Jewish than of the Italian group were reading above expectation, while 5 percent more of the Italian group were reading below expectation, considering their mental age."

Because of the large number of Spanish-speaking people in certain sections of the country, much interest has been expressed recently in the reading achievement of Spanish- and English-speaking pupils. Manuel (450) and Kelley (443) have reported the results of somewhat extensive comparisons of the two groups in Grades II to VIII, inclusive. Their findings show clearly that the Spanish-speaking child is definitely handicapped. He either achieves far less at particular grade levels or is much older, or both, than English-speaking pupils. Such findings make it clear that schools which are attended by foreign-speaking children face the responsibility of attempting to adjust instruction to the needs of such children and to facilitate learning as much as possible. Many centers are attacking

this problem intelligently, as revealed by a recent report of a five-year experiment in the San Jose Experimental School, University of New Mexico (454), which showed that reading ability of the Spanish-speaking children can be definitely improved if appropriate methods are used.

Remedial Teaching

In recognition of the needs of poor readers at various grade levels, an increasing number of studies of remedial types of teaching have been made during recent years. Essential characteristics of a remedial program have been defined by Witty and Kopel (485) as follows: intelligent cooperation on the part of all teachers; reading emphasized in all school subjects; reading activities associated with the spontaneous interests of pupils; and major emphasis given to reading as a thought process—not a drill acquisition. Supplementing the foregoing general principles, various investigators have directed attention to the value of specific procedures. For example, Dolch (411) stressed the importance of developing a basic sight vocabulary as the first step in remedial reading. MacLatchy and Beavers (449) presented evidence which showed the importance of adapting instruction to the varying needs of pupils at the sixth-grade level. Witty and Kopel (488) gave vigorous emphasis to the value of remedial procedures which utilize the ascertained interests of pupils, and they presented evidence which supported their recommendation.

Many of the procedures suggested above are utilized in efficient teaching of pupils who are making normal progress. This view is clearly illustrated in the following explanation by Betts and Donnelly (395) of the nature of remedial instruction: it "involves the determination of the pupil's level of achievement, interests, strengths, and weaknesses; and the provision of instruction for filling in gaps and changing the attitude toward reading. In short, remedial instruction is based largely on first-teaching procedures." The statement should be added that investigations in this field have also emphasized the value of certain procedures not commonly used in group instruction. As their value is recognized they are being utilized more and more widely as essential steps in all good teaching.

Causes of Reading Disability

The causes of poor reading and of extreme reading disability have been studied with unusual intensity during the last three years. Several investigators, such as Gates (430), Monroe and Backus (452), and Witty and Kopel (486) have prepared summary statements of causal factors based on the results of their own studies and those of others. A very detailed outline of such factors was reported by Monroe and Backus who organized conditioning factors under the following general headings: constitutional, intellectual, emotional, educational, and environmental factors. Whereas there is general agreement that certain factors may influence the reading attitudes and habits of children, investigators are not in complete agree-

ment as to the extent of the influence exerted or the relative importance of various factors. Such differences are illustrated specifically in some of the sections that follow, particularly the one concerned with the relation of poor vision to reading disability.

As a result of a series of case studies, Witty and Kopel (485) identified the following contributory factors and the relative frequency with which they occurred: lack of interest (84 percent); meager background of experience (82 percent); incorrect placement in school (80 percent); inability to sustain attention for a desired end (40 percent); emotional instability (36 percent); circumscribed interests in recreational life (34 percent); excessive oral reading in the primary grades (20 percent); frequent change of school (18 percent); defective vision or hearing (12 percent); illness and poor physical condition (12 percent); change of left to right handedness (4 percent). The relative importance of the foregoing factors holds only for the cases studied. The investigators concluded that "the many causes of poor reading make individual psychological diagnosis imperative in every case of inferior reading." The additional fact has been emphasized as a result of numerous investigations that the cause of reading disability does not lie as a rule in a single factor. Thorough study of possible causal factors is therefore essential in each reading disability case. In making such studies the fact should be kept clearly in mind that factors similar to those listed above may often be consequences rather than causes of reading difficulty.

Causes of Reading Disability among Mentally Defective Pupils

The influence of general mental deficiency on progress in reading is widely recognized. Very few intensive studies have been made of supplementary contributing factors in such cases. As a result of detailed diagnoses of 23 mentally defective cases, Sears (461) concluded that "the incidence of word blindness, in the sense of a severe special disability caused by a specific organic brain defect," was "extremely slight in this group" and that "deficiencies in the associative learning abilities" measured by the Gates test "are seldom causes of reading disability." "In the few cases in which the tests appear to indicate such deficiencies it seems that the difficulties may often be due to rather readily remedial bad habits of perception of the more complex visual word-like forms." Hegge (439) presented evidence supporting the conclusions of Sears. He also pointed out that "obvious complications of a strictly medical, neurological, or psychiatric nature" are "apparently not frequent"; neither is there pronounced tendency for "special reading disability cases to be deficient in auditory memory span" or to exhibit "anomalies in eye-hand preference." The findings of Sears and of Hegge suggest the need of additional investigations to determine which causal factors, if any, contribute to reading disability in the case of mentaliy defective cases more frequently than among poor readers of normal or superior mental ability.

Visual Defects and Reading Disability

The relation of visual defects to reading disability has received more attention during the last three years than any other single problem. More or less detailed studies have been reported by Betts (394), Eames (417, 418, 419), Farris (421), Fendrick (423), Gates (430), Taylor (464), Witty and Kopel (486), and Wagner (476). It will be impossible here to do more than indicate the general points of view presented and several significant findings.

Certain investigators, of whom Betts and Taylor are representatives, attach large significance to visual defects as factors in reading disability. Other investigators, such as Witty and Kopel, are far more conservative. These differences are due in part to the nature of the data on which conclusions are based. If intensive studies are made of remedial cases, the investigator is impressed repeatedly with the fact that many poor readers suffer from visual defects of one type or another. If comparative studies are made of the incidence of visual defects among good and poor readers, one is impressed with the fact that they do not occur much more prominently among one group than the other. In such cases there has been a tendency to depreciate the influence of visual defects upon reading efficiency. The fact should be recognized, however, that many pupils read well in spite of visual defects and that they might read better or with less discomfort if such defects were corrected or eliminated. In any event, the fact is now widely accepted that visual examinations are essential as a part of individual diagnosis.

The types of visual defects which characterize poor readers have received specific consideration. Fendrick (423) found in a study of 65 seriously retarded readers and 65 normal readers that the percent of poor readers who suffered from binocular visual acuity was 25 percent greater than among good readers, and that astigmatism occurred 19 percent more frequently among poor readers. Eames (417, 418) secured evidence which showed that "the amplitude of fusion convergence is lower among non-readers than among unselected cases," that incoordination of the eyes was the most frequent visual defect identified "occurring much more frequently among the poor readers," and that restricted visual fields were found more frequently among disability cases. Such studies are very helpful in that they identify certain visual defects which occur most frequently among poor readers. The fact should not be overlooked, however, that visual defects vary widely among poor readers and that a systematic visual examination of each case is essential in a thorough diagnosis.

Cerebral Dominance in Reading Disability

Although much emphasis has been given to anomalies of lateral dominance as a cause of reading disability, the results of recent studies tend to minimize the importance which should be attached to them. For example, Eames (416) found that "the frequency of lateral dominance anomalies is not much greater among poor readers than among unselected cases."

As was pointed out in the preceding section, too much significance should not be attached to the results of *group* studies of this type. The conclusions of Witty and Kopel (491) tend to support those of Eames:

> The data in this paper have shown a lack of relationship between various conditions of handedness and degree of reading efficiency. Eyedness was similarly found to be unrelated to reading proficiency. Mixed hand-eye dominance (as well as consistent manual-ocular behavior) was found to have no association with reading ability as measured by standardized tests and as gauged by the tendency to make reversals.

The authors recognize that these conclusions are doubtless too sweeping in character and qualify by stating that "decisive as these findings are, they do not warrant discarding the study of laterality in the diagnostic examination of a reading disability case."

Reversal Errors in Reading

Closely associated with the theory of lack of lateral dominance in reading disability cases are problems relating to the causes of reversal errors. As a result of a study of such errors among young children, Davidson (405) secured evidence which led to the conclusion that "the theory of the lack of cortical dominance will hardly be adequate to explain the reversal type of error. There is the possibility, of course, that all reversal types are not due to the same cause." The need for additional study of the etiology of several errors was emphasized. As a possible aid in explaining different types of reversal errors, Wechsler and Pignatelli (479) called attention "to a variety of spatial disorientations in the configuration of letters." Their contention is that the term *reversal* is too broad and vague to be of scientific value. They pointed out, however, that phenomena of axial rotation explain only a minor part of the errors that occur.

Auditory Defects and Reading Disability

Unfortunately the auditory defects of poor readers have been studied far less intensively than have visual defects. Because of the close relationship of such defects to speech habits, as well as to reading achievement, it is highly important that the nature and significance of auditory defects should be studied thoroughly. An important contribution in this connection has been reported by Bond (397) who found that good and poor readers differed significantly in auditory acuity. He also discovered that "some relationship exists between the method of instruction and the extent to which auditory abilities are factors associated with reading disability." If the pupil is exposed to an oral-phonetic type of instruction, "auditory ability appears to be a factor of importance in relation to reading disability. If, on the contrary, the pupils are taught, by predominantly look-and-say technics, auditory factors do not maintain their dominant position as characterizing elements associated with inadequate reading performance (397:43). More studies are needed which point out the conditions under which possible causal factors exert a definite influence.

Emotional Development and Reading Disability

As indicated in an earlier section emotional characteristics of the learner often help to explain slow progress in learning to read. With almost equal frequency the effect of inability to read upon the emotional life of the child is now emphasized. Blanchard (396), for example, pointed out that "emotional reactions and emotional difficulties may be too little taken into account and interpreted too superficially, in many cases, as resulting from the trouble with reading rather than as preceding and producing it." Such a relationship was assumed in the remedial reading section of the character education project in Washington, D. C., which was reported recently by Monroe and Backus (452). Fendrick and Bond (422) also reported evidence which shows that there is marked relationship between reading maladjustment and delinquency.

Hygiene of Reading

This summary should not be concluded without brief reference at least to the results of studies relating to the hygiene of reading by Webster, Paterson, and Tinker. In a summary by Tinker (470) of legibility experiments during the past three years, the fact was pointed out that most of the legibility experiments reported have been concerned with the "relative legibility of typographical arrangements encountered in the consecutive reading of children and adults." The relative legibility of "ten type faces printed in ten point type on white enamel paper" was studied by Webster and Tinker (478) by determining "the average distance from the eyes at which single words could be read correctly." The results "differed markedly from legibility measured in terms of speed of reading," and showed clearly that certain factors which increase perceptibility of words at a distance reduce speed of reading. This distinction is significant. The same investigators studied the influence of "egg shell," "artisan enamel," and "flint enamel" paper surfaces upon the perceptibility of words, but failed to find any significant differences during short working periods. They concluded that "the alleged eye-strain from reading material printed on glazed paper must be due entirely to continuous reading in light not uniformly dispersed rather than to inability to see the print satisfactorily" (477). In a series of studies of typographical factors influencing speed of reading, Tinker and Paterson (473) found (a) that the factor of "set" did not influence differences in speed of reading when variations in typography are introduced, and (b) that "slight differences in color of printing surface and striking differences in degree of gloss do not influence speed of reading. Finally, Tinker (472), after reviewing the results of several studies, concluded that "there is nothing to justify the suggestion that twenty-five to several hundred foot-candles of light is essential for easy and efficient reading of legible print by those with normal vision. The data indicate that relatively low intensities are entirely satisfactory; in fact, if eye strain is to be avoided, low intensities are necessary in situations where the diffusion of light is poor."

CHAPTER VIII

Science

Wilbur L. Beauchamp, with the cooperation of Francis D. Curtis and Ralph S. Powers

RECENT RESEARCH concerning the teaching of science in the elementary school is not extensive. The type of research which is appearing is largely the outcome of the report of the Committee on Science Teaching of the National Society for the Study of Education (508). This committee recommended that a functional understanding of those principles and generalizations of science which ramify most widely into human affairs be taken as a major objective of science teaching. The report has stimulated research to discover the principles and generalizations of science appropriate for the elementary school. Investigations have also been made to determine the ability of pupils of various grade levels to generalize from specific data and to apply generalizations in the interpretation of problem situations. While only a few of these studies have been made, they represent an encouraging trend in research which should ultimately provide data for a properly graded and integrated curriculum of science for the elementary school.

The studies reviewed are arranged under the following categories: (a) bibliographies, (b) curriculum, and (c) the learning process.

Bibliographies

During the period several helpful bibliographies appeared. Powers (510) and McSpadden (507) summarized the most important articles referring to the curriculum and teaching procedures in elementary science. Pieper (509) prepared a summary of the research relating to science education for 1934, 1935, and 1936. Bruce (500) and Pruitt (511) prepared lists of elementary science references and materials. These lists include references for teachers and pupils of different grade levels.

Curriculum

Burgess (501) investigated children's interests in science materials. These interests were discovered through a tabulation of pupils' questions and reactions to material studied, and through tests in which pupils wrote all of the science facts they could remember during the semester. Studies were also made of interests dominant at certain seasons of the year. The order of interest in materials was (a) physical science, (b) animal life, and (c) plant life.

Fitzpatrick (503, 504) made a study of pupil testimony concerning their science interests. Tests were constructed to obtain evidence concerning the consistency and stability of pupil interest. The results showed that the bulk of pupil testimony gave evidence of being unstable, inconsistent, ill-considered, and unreliable. The study raises grave questions

concerning the reliability of the studies purporting to discover the interests of pupils.

Haupt (505, 506) investigated the kinds of learning which result when a generalization of science is used as an instructional objective throughout the six grades of an elementary school. His results indicated that the same kind of mental activity occurred on all six grade levels. Differences that existed were in the complexity of the product which the activities yielded. He concluded that the same objective can be used to select elements of learning for presentation throughout a range of grade levels.

Robertson (513) analyzed the results of studies purporting to select the principles of science that occur or are implied in magazines, in the textbooks of general science, and in the textbooks of the specialized sciences. The list of principles was combined and submitted to subjectmatter specialists for criticism. The revised list was then sent to carefully selected teachers and supervisors of elementary science who were asked to indicate their judgment of the suitability of the principles as ultimate goals in elementary science. One hundred and thirteen principles were finally selected.

Robertson (512) collected questions asked by pupils that might lead to a functional understanding of a principle of science. Two methods of collecting questions were used: (a) questions asked by pupils in the science classes of 42 schools were recorded by cooperating teachers; and (b) pupils were asked to write questions they would like to have answered. A total of 6,429 questions was secured. The frequency of each principle in the list was then ranked according to the number of questions the answers to which were deemed to lead to a comprehension of the principle.

The Learning Process

Croxton (502) experimented to discover whether children in the various grades were able to formulate and apply a principle after exposure to the essential experience basis. Demonstrations were performed by the teacher, and pupils were asked a question to test their ability to generalize. This was followed by a question to test their ability to use the generalization to interpret a new situation. The data indicated that many pupils in the higher primary, the intermediate, and the junior high-school grades are capable of generalizing. No markedly superior ability to generalize was shown by junior high-school as compared with intermediate pupils.

Bedell (499) investigated the relationship between the ability to recall and the ability to infer in specific learning situations. He used 324 students regularly enrolled in general science courses and junior high-school science courses. Paragraphs were constructed which gave certain facts from which the desired science principle or generalization could be inferred. The results showed that there were significant differences between the ability to recall and the ability to infer. The lowest one-fourth in intelligence were unable to do inference of the type demanded. The evidence indicated that it is not sufficient to teach facts with little or no suggestion of their relationship to science generalizations.

CHAPTER IX

Social Studies

Howard E. Wilson, with the cooperation of Edgar Dale, Wilbur F. Murra, and Rolla M. Tryon

A REVIEW OF RESEARCH in the teaching of the social studies in the elementary school is difficult because of the variables involved. The meaning of research itself is somewhat nebulous; the scope and character of the social studies program is extraordinarily varied; the elementary school is not a precisely defined unit. In this discussion, however, reports are made of investigations which represent critical analysis under relatively well-controlled conditions of problems incident to the teaching of whatever aspects of the social sciences are selected for curriculum use in grades organized within an elementary school.

All published research studies hereinafter cited appeared between July 1, 1934, and July 1, 1937. Unpublished studies also are limited to the same three-year period, with the exception of a very few previously unreported items which were completed during the first six months of 1934. This review brings down to date the corresponding summary on methods in elementary-school social studies by Wesley (580), which appeared in the *Review of Educational Research* for February 1935, and which dealt with research reported before July 1, 1934. The material included in the present summary should be used in connection with Wesley's review, and with Hockett's review (547) of curriculum investigations in the social studies, which appeared in April 1937; and also with Wilson's summary of research in social studies methods on the high-school level, to be published in the February 1938 issue of this magazine (582).

The investigations herein reported are grouped under eight headings: (a) objectives; (b) the curriculum; (c) status in European schools; (d) teaching method; (e) vocabulary, grade placement, and meaning; (f) technic of testing; (g) equipment; and (h) historical background.

Objectives

State courses of study in the social studies for the elementary grades were analyzed by Barnett (517) for the purpose of investigating their stated objectives. Great diversity as to forms of phrasing objectives was found, although nearly three-fourths of the objectives included one or more of the following nine terms: understanding, appreciation, knowledge, ability, habit, interest, skill, ideal, and concept. Objectives bore very little relation to grade level or type of course organization. Smith (571) formulated a set of objectives for the study of recent American history and submitted them to a committee of twenty-two competent judges who were asked to indicate their opinions as to the validity of each. His findings are presented quantitatively.

The Curriculum

Nationwide practices with respect to curriculum offerings in the social studies in 1934-35 are reported in the Fourteenth Yearbook of the Department of Superintendence (560). Questionnaire reports, listing the "courses or phases" of social studies offered at each grade level, were received and tabulated from widely distributed groups of 849 six-year elementary schools and 342 eight-year elementary schools. Complete detailed tables summarize the data, yielding a confused and indefinite picture of combinations of subjects and phases at every grade level and especially in the lower grades. Some evidence as to the trend of school offerings during the period 1930-35 is also given.

Harap (545) studied nearly 300 courses of study published during 1933 and 1934 and noted a marked increase in the tendency for courses in social studies to be fused or integrated. This characteristic was most noticeable in the primary grades. A less comprehensive, but more analytical, review of courses of study in this field was reported by Templin (575), who used ten recent courses of study for the third grade. An exhaustive survey of the present status of the social studies as subjects of school instruction, in both elementary and secondary schools, based upon numerous earlier research studies, appeared in Tryon's volume (577) for the Commission on the Social Studies. The author gives particular attention to the problem of internal course organization, with summaries of theories, practices, and research evidence.

The social studies curriculum is viewed critically from the standpoint of its component parts in a series of articles comprising the Sixth Yearbook of the National Council for the Social Studies (558). Although most of the contributions are primarily concerned with the secondary level, at least three chapters will be found to have particular interest for the elementary curriculum: viz., American history, geography, and local and state history. Biography as an element of the curriculum in Grades I to VI was studied by Armstrong (516), who examined 53 courses of study and found biography very generally included in them, with particular persons to be studied usually prescribed. Most characters were in the field of politics or war, and women were very scarce. Emry (534) analyzed and classified those elements from geography which were deemed pertinent to training for social intelligence.

Integration of subjectmatter occupied the attention of many curriculum investigators. At least four master's theses appeared which were devoted to setting forth principles and actually constructing courses along consolidated lines. Saunders (568) used the study of Indian life as the theme of a unified program; Broadbent (518) and Crowley (527) proposed a correlation of music with the social studies in Grades VII and VIII; and Gillett (538) dealt with the problem of correlating composition with the study of pioneer history in Grade III.

Although discussion about integration was widespread, and specific proposals and analyses such as those cited in the preceding paragraph were numerous, the actual objective appraisal of the merits of integrated courses was rarely essayed. Two studies aimed at this end deserve mention. Seagoe (569) prepared two sets of reading materials covering the same facts—one of which was divided into separate accounts for history and geography, and the other of which interwove the historical and geographical elements into a single whole. Equated groups of eighth-grade pupils were given the reading material and were then tested immediately and again after a month's interval. The group which read the unified account demonstrated a superior mastery of facts and insight into interrelationships, on both original learning and retention. Findings in favor of integration were also reported by Oberholtzer (562) who tested more than 2,000 pupils in Grades IV and V. He found that greater learning of social studies information seemed to result from courses which integrated the social studies with the rest of the school program than from a fused social studies course which was taught separately from the rest of the curriculum.

Status in European Schools

R. B. Clark (524) made an extensive survey of the status of geography as a subject of study in European schools, with respect to curriculum, methods, and equipment. In general, her report reveals a much greater emphasis on geography in Europe than in the United States, although this fact is less true of the elementary schools than of the secondary schools. The outstanding features of geographical instruction in Europe are summarized in the following paragraph:

> The teaching of geography in European elementary schools offers valuable suggestions for us in the skill with which material is drawn from and concentrated upon the home region; in the plan of extending a more mature type of community study into the middle grades; in the continuous use of maps; in the early introduction to the topographic map; in the out-of-door lessons and school excursions; in the demand for much drawing and sketching; in the frequent and skilful reviews; in testing for accurate description and clear explanation.

Shropshire (570), in a thorough study of history teaching in the schools of England, devoted a full chapter directly to the place of history in elementary education. Despite a prevailing skepticism as to the values of historical study, it has made steady gains in the school curriculum—to a greater extent in the elementary than in the secondary schools. With younger children the content is almost exclusively biographical, and in the upper grades the biographical approach to systematic world history is very common. On all levels there is great diversity of content and method because of the decentralization of the English school system. Oral instruction constitutes the prevailing method, although the use of visual aids and pupil activities has been greatly increased in recent years.

Teaching Method

Methods of Instruction in the Social Studies, by Horn (549), published in 1937 as Volume XV of the Report of the American Historical Association Commission on the Social Studies, is perhaps the most significant single contribution to research in this field which appeared during 1934-37. Although not a first report of original research, its great value lies in its comprehensive, interpretative synthesis of previous research findings. Particular attention is given to the learner's side of the teaching process. Problems on both the elementary and secondary levels are considered.

Feany reported a survey (536) of methods of teaching and the use of equipment which is excellent background for the further analysis of developments in this area. He secured reports dealing with objectives, instructional procedures, presentation of subjectmatter, assignments, units of instruction, class organization, and equipment based upon direct observation in 250 selected classes in 38 school systems during the winter of 1933-34. The picture he draws from the reports

> . . . . indicates in general the activities one would be likely to see upon stepping into a social studies class of the sixth, seventh, and eighth grades in this territory. The objective of the model lesson would be the determination of the degree to which pupils have mastered facts in the textbook. Observing such a lesson one would probably see a part of the period devoted to supervised study. There would be extensive questioning by the teacher, or preparation for discussion by the teacher, such as an overview. In the course of the lesson there is a fair probability that pupils would volunteer personal experiences related to the topic of the lesson. The chances would be about four out of five that the material would be presented as a subject. The work would probably be part of a long study unit of some nature, as the Morrison unit. The class would in most cases be organized and dealt with as a whole. Sometimes one might find pupils working in groups but very seldom, if ever, would there be complete individualization of the pupil's work. The assignment given would consist of further work on problems in a unit already assigned. Probably it would require the study of several texts and sources according to a teacher-prepared plan. It is doubtful if the observer would notice any effort at motivation by the teacher. Chances of seeing any creative activity projects are very small. In checking the equipment used, one would note the use of the textbook and sets of supplementary textbooks, the use of a bulletin-board, and in most cases immovable seat desk units. There would likely be an encyclopedia of some kind, and papers for collateral readings. Also there would be a good chance of seeing a political-physical wall map in use. However, other types of visual aids, radio programs, phonograph records, talks by outside experts, modeling and construction supplies, or economic and industrial exhibits would seldom be found.

The picture presented is not a pleasant one for the observer who is interested in the application of the results of research to actual practice.

Less extensive than the above and based on a less direct approach are the summary descriptions of prevailing methods reported by Culmer (529) and Reene (564). Both studies deal with the middle grades and both attempt to set up model schemes for unit teaching. Culmer emphasized integration of content through socialized procedures. Reene proposed an original pattern for method, consisting of three steps: motivation, investi-

gation, and interpretation. A rather uncritical compilation of 16 methods and 10 devices used in the teaching of current events was made by Horton (550).

Citing test results to validate their proposed procedures, two investigators, Harden (546) and Curtis (530), stressed the value of field trips. Harden found a significant increase in seventh-graders' "sensitiveness" to housing problems by testing both before and after a class trip to slums and model housing projects in New York City. Curtis demonstrated the efficacy of field trips in learning the rudiments of physical geography.

Direct instruction was shown to be effective in developing selected skills, understandings, and attitudes in a series of four research studies. Campbell (520) concluded that he had improved the international attitudes of pupils in a geography class by deliberate indoctrination, appraising the outcomes on the basis of relative gains between pre-test and re-test of a control group and an experimental group. Less well controlled and less conclusive were the studies of Cropper (526) and Sorenson (572), which claimed to show the advantages of direct instruction in interpreting textbook pictures and maps, respectively. Most thorough and most convincing of the reported studies of this type was that of Chase (523). In a series of experiments using the equivalent groups and the rotation methods, dealing with five sets of sixth-, eighth-, and ninth-grade history classes, Chase obtained data pointing to the conclusions that (a) improvement in time and place sense must be brought about by *direct* rather than by incidental teaching; (b) achievement in time and place relationship can be secured without jeopardizing fact achievement; and (c) greater achievement in more aspects of history learning can be secured by the "relationship method" than by questions and answers.

Davis (531) presented fairly convincing statistical evidence to show that greater learning results when pupils write out responses to study helps than when they merely recite orally on them, and that pupils profit more from having the teacher correct their written responses than from making their own corrections. Stadtlander (573) reported data suggesting that pupils learn more from large pictures and lantern slides presented to the class as a whole than from small pictures studied individually.

Vocabulary, Grade Placement, and Meaning

Research has been more prolific in this area than in any other. Vocabulary studies of various kinds have been particularly numerous, most of which have presented descriptive statistical summaries of the vocabulary difficulties of reading materials, usually leading to the conclusion that they are unnecessarily difficult. Of such a nature are: Notz' analysis (561) of fifth-grade geography books, Ward's study (578) of a seventh-grade history text, and the numerical ratings for both difficulty and diversity of vocabulary given to each of 77 named elementary social studies books as determined by W. W. Clark (525). Leavell and Hollister (554) found that 300 pupils in Grades VII and VIII listed as unfamiliar to them 3,733

different words found in the social studies books they were using. Diehl (532) made a study of all words relating to maps found in four sets of geography texts and further analyzed her findings by classifying the terms as to function and kind. She noted that the major burden of acquiring an understanding of map terms falls in Grades IV and V.

The inadequacy of mere word counts and general word lists as criteria for the grade placement of reading materials in history is pointed out by Chase (522), who emphasized the particular requirements for understanding historical accounts and the need for more than mere recognition of words in order to achieve meaning.

The most extensive social studies word list yet published is that prepared for the volume on *Tests and Measurements in the Social Sciences* (551) sponsored by the Commission on the Social Studies of the American Historical Association. This list is comprised of about 4,500 words, including a composite of several previously published lists. For each word is given some evidence as to difficulty and utility. In the same volume, are reported research findings as to the understanding of social terms by elementary-school pupils.

The problem of achieving understanding from a reading of social studies materials has been attacked persistently and systematically at the State University of Iowa in a series of master's theses directed by Ernest Horn. No less than six such studies were completed in 1934 and 1935. Crumrine (528) and Ryan (566) studied pupils' comprehension of quantitative terms on the sixth- and fifth-grade levels, respectively. Kerr (552) and Stolte (574) studied pupils' abilities to understand geographic concepts found in their geography textbooks. King (553) analyzed comprehension of place location references found in American history textbooks, and Thompson (576) examined pupils on the meanings they derived from reading accounts in American history. Although space limitations prevent a separate review of each of these six studies, enough findings reappear in several or all of them to permit the following generalizations: (a) the actual extent and nature of pupils' understanding of what they read in social studies textbooks is probably much less adequate and less accurate than their teachers realize; (b) inconsistencies of pupil response to questions involving the same concepts when tested for by different technics (recognition, recall, and oral interview) suggest that usual methods of measuring understanding probably overestimate actuality; (c) intelligence has probably been overestimated as a factor in reading comprehension as compared with interest, specific training in reading, and background of accurate knowledge; and (d) if textbooks would utilize more concrete and definite terms, pupils' comprehension would be facilitated. These investigations and many more of a similar nature are summarized and interpreted in the volume by Horn (549), previously cited.

Further study of children's comprehension of social concepts has been reported by Michell (557) and Ferrerio (537). Samuels (567) found that many civic terms were very little understood by sixth-grade pupils

and discovered that of those terms that pupils did know, only about 20 percent had been learned in school as compared with 38 percent which had been learned at home, 7 percent from general reading, and 35 percent from outside sources. Additional data on the nature of children's attainment in social studies are to be found in the reports of Welch (579), who studied attitudes and habits of eighth-graders, and of Hahn (543), who classified the errors found among 283,000 answers to questions asked on the *Hahn-Lackey Geography Scale.*

Technic of Testing

The volume, *Tests and Measurements in the Social Sciences* (551), previously cited for its vocabulary studies, stands apart from all other research for the period here under review as a source of pertinent evidence basic to an understanding of problems and technics of measuring the outcomes of social education. Although the book in its entirety bears some relevancy to the problems of the elementary school, those sections of most concern to this level are the chapters on: testing the special vocabulary of history; testing concepts in the social studies in Grades IV to IX; tests in geography; exercises in the use of historical evidence; tests of character traits. In nearly all instances the authors describe how their tests were constructed and present sample items and summaries of results obtained.

Cain (519) examined 13 standardized tests and found that the items included dealt more largely with place geography than with any other aspect of the field, and that only 895 out of 4,782 questions required thinking ability, whereas the remaining 3,887 questions required factual recall.

A series of tests of basic skills in the social studies were devised at the State University of Iowa and were standardized for Grades VI, VII, and VIII on the basis of some 25,000 pupils' scores. The data thus obtained were analyzed by Rogers (565) and H. R. Anderson (514). The latter writer pointed out the extreme variabilities which exist among pupils in respect to all traits measured: reading maps, charts, graphs, using basic reference books, alphabetizing, and using indexes. He noted that "in no case did the median for any grade fall above the seventy-fifth percentile for the preceding grade or below the twenty-fifth percentile for the succeeding grade. . . . The relatively small average gains from grade to grade further indicate that most schools have failed to isolate basic skills for instruction or that instruction has been inadequate."

Ellis (533) devised three types of tests to measure a knowledge of civic terms. Hadley (542) constructed a test on the Civil War period for the eighth grade to illustrate her scheme for building tests to be used in classes where a variety of textbooks is used. Grim (541) constructed a scale for measuring attitudes with respect to militarism, nationalism, racialism, democracy, economic individualism, and labor and unemployment.

Equipment

Investigations concerned with the evaluation of instructional equipment have been less numerous than in many previous years. As usual, most attention was given to textbooks. In this connection, the several vocabulary studies summarized in an earlier section of this review should not be overlooked. Two authors (540, 544) attempted to facilitate the objective appraisal of geography textbooks by preparing checklists. Another (521) analyzed *desiderata* and deficiencies of textbooks in order to provide data to guide authors in the future.

Melbo and Waterman (556) examined the pictures in eight series of geography books for Grades IV to VII. They found that pictures account for from 20 to 25 percent of all materials included, that there is little uniformity among the several books, that the types of pictures chosen apparently have little or no relation to the fundamental organization of materials, and that many of the pictures included are of questionable educational value.

Graphs as aids to learning in the elementary school were the object of intensive study by Goetsch (539) in his doctoral dissertation. He conducted controlled experimentation in an effort to determine the relative effectiveness of different types of graphical representation in addition to reviewing previous research studies and prevailing practices. He reported that the use of graphs and charts by teachers and by textbook authors in the field of the social studies had been increasing markedly in the years immediately before he wrote. He noted that research had been inconclusive as to the instructional values of graphic aids but explained these findings as being primarily due to the inability of pupils to read graphs correctly.

Historical Background

The appearance during the years 1934-37 of several substantial contributions to our knowledge of the history of content and method in elementary social studies suggested an increase of interest in this area. The foremost publication was the 1935 Yearbook of the National Council for the Social Studies, entitled, *The Historical Approach to Methods of Teaching the Social Studies* (559). Although this volume deals somewhat more largely with the secondary level, certain portions bear rather pertinently upon past practices in the elementary grades. Among these are the chapters on biography, equipment, visual aids, textbooks, and rural schools.

Tryon (577) provided an extensive review of the history of the social studies, excluding geography, in the schools of the United States. His volume dealt with both the elementary and secondary schools and touched more generously upon curriculum offerings than upon methods of teaching.

Contributions of the Herbartian movement to elementary-school history are reviewed in a doctoral dissertation by McMurry (555). In this admirable monograph were shown the changes effected in ideals and practices

of elementary history instruction in the United States by the introduction of Herbart's doctrines in the 1890's. It is pointed out that, although strict Herbartian theory in this field achieved only a partial victory, its indirect influence was very great during the course of the movement from 1890 to 1916.

Price (563) summarized the major trends in the teaching of history in the elementary school during the years 1899-1934 as revealed in 94 periodical articles published during that period. One of her most striking findings is that many recent emphases (such as integration of content, pupil activity, and the teaching of cause-and-effect relationships) are much older than is commonly believed. The unit approach and visual aids represent the more characteristically recent centers of attention.

Geography teaching was viewed historically in two master's theses. Engle (535) noted trends exemplified in 195 articles published during the period 1898-1934. Wigger (581) traced the history of geography in the elementary schools of the city of St. Louis.

M. A. Anderson (515) prepared a thorough and critical historical treatment of the use of constructive activities in elementary social studies from 1880 to 1930. She reported a steady increase in the use of such activities during the period studied but observed that few new forms of activity appeared later than 1900, although many new forms were first introduced during the 1890's. In her evaluation of the relative merits of different forms of activities, judged on the basis of their contribution to child understanding of realities, she rated highest: working models, the reproductions of processes, and symbolic representations such as maps. Lesser commendation was accorded still models constructed of materials similar to those used in the actual objects. And lowest rating was given to drawings, paintings, miniature scenes, and models of clay or paper or cardboard. Hogan (548) contributed a similar study of constructive activities, although she confined the scope of her investigation to the primary grades and to the years between 1926 and 1936.

CHAPTER X

Spelling

Frederick S. Breed, with the cooperation of Fred C. Ayer, T. G. Foran, and Ernest Horn

THE PRESENT CHAPTER contains a summary of studies relating to the teaching of spelling which were published during the period from July 1, 1934, to June 30, 1937. The summary is confined to the period mentioned except for a few studies of earlier date that were unintentionally omitted from the report for the preceding triennium. The chapter takes cognizance not only of quantitative reports, but also of critical discussions. It is a cooperative effort in the sense that a tentative bibliography was prepared by the writer and submitted to the other members of the committee for corrections and additions. On the basis of a revised bibliography the first draft of the chapter was prepared by the writer, submitted to the other members of the committee for suggestions, then modified to take account of these suggestions. In its present form the chapter is a summary of 79 reports.

Bibliographies

During the three-year period with which the summary is concerned, several annotated bibliographies, and summaries accompanied by bibliographies, have appeared. Spelling was represented in the lists of references to educational literature prepared by R. A. Gray (620, 621). Breed (590) summarized 67 studies published during the period from July 1, 1931, to June 30, 1934. Breed (589) also prepared annually a selected and annotated bibliography of publications, 37 in all, that appeared between July 1 and June 30, 1933-34, 1934-35, and 1935-36. Lastly, McKee (632) presented the results of 33 studies published between December 1, 1933, and November 30, 1936.

There is a large amount of overlapping in the reports referred to, some of which might well be avoided. *The Review of Educational Research,* for example, covers the field of the elementary-school subjects both in the issue devoted to the curriculum and in that devoted to special methods.

Selection and Gradation of the Vocabulary

Words heretofore reported in studies of the writing vocabulary of children have been selected on the basis of frequency of use in themes, frequency of misspelling in themes, frequency of use in letters written outside of school, and frequency of occurrence in free or controlled association. Smith (648) has opened a new source—papers written in various school subjects. His vocabulary consists of 9,416 different words tabulated from 238,654 running words found in 2,711 papers. Fitzgerald (603)

reported that the vocabulary of children's letters which he developed and Horn's writing vocabulary of adults are identical to the extent of 76 percent in the 100 words of highest rank in each and that 3,300 words of the first vocabulary are found in the first 5,000 of the second.

Anderson (584) compared the vocabulary of literary men with that of the average adult. Her results, in comparison with available data on children's usage, enable one to report that the literary men wrote nearly twice as many different words as the children in about half the number of running words. Gates (611) computed the average grade position of each of 3,876 words of commonest occurrence in 25 spelling texts and courses of study; also, the percent of comprehension of each word at different grade levels. Both sets of data will contribute to the more scientific gradation of the course of study in spelling.

Reformed Spelling

Interest in reformed spelling smolders on in spots without starting any very general blaze. Logan (628, 629) reported Noah Webster's intense interest in spelling reform and indicated departures from British orthography for which he was largely responsible through his *American Dictionary of the English Language,* 1828. That English spelling is due for a "spring cleaning" is the opinion of Murray (638). Language undergoes changes, he reminds us, but the symbols claim a perpetual lease of life. This is unfortunate if the word that sets the style is as ingeniously spelled as the word *usage* by King John, who, Murray stated, performed the feat of writing this word without employing a single letter found in it today: *yowzitch.*

There are many deterrents to reformed spelling besides the inertia of tradition.

Methods and Devices

During the period under review the largest number of reports dealt with problems of method, and, within this area, reports concerning "progressive" practices and the principle of generalization were most numerous. Though most of the reports of "progressive" procedures made no pretension to objectivity, a representative group is included herein so that the interest in this direction may be observed and the need for investigation emphasized.

"Progressive" procedures—Comstock (595) reported that writing diaries proved to be an effective mode of approach to the acquisition of spelling skill in the primary grades. An approach through a series of interesting activities in the second grade was described by Crider (597). Howland (625), similarly, described a method of teaching spelling in close relation with handwriting and composition. None of the three articles provided quantitative data on results. Horn (624) contended that, if spelling is taught incidentally in connection with English composition, the course

"should be planned, first, to deal with those situations in which children most frequently need to write, and, second, to insure growth through these situations . . . to the point where children can write efficiently in the common and important situations that demand writing in adult life."

Higley and Higley (623) contributed one of two experiments relating to the type of approach under discussion, a study of the method of learning "by visual perception," avoiding analysis and learning by wholes. Letter marks and examination scores were reported as favoring the method in two experimental classes. The value of visual perception and the value of analysis have both been demonstrated in previous experiments. The important question is, Should the first be employed to the exclusion of the second? Gates and Graham (613) conducted a much more extensive experiment employing 28 classes in Grades II to VIII. Results from the test-study and study-test methods, as ordinarily employed, were compared with results from a course containing various types of word games and activities. The conclusion reached was that the methods compared led to improvement in spelling ability to about an equal degree and that 89 percent of the pupils who had had experience with both methods preferred programs of games and activities. Whittenburg (659) indicated types of exercises believed to be suitable for enrichment of the work of bright pupils. Carnegie (592) described a highly dramatized contest as the crowning point of the year's work in spelling. Such a contest, it should be observed, may appropriately supplement other efforts, but its oral pattern must not become a general substitute for the written pattern in social demand.

Pre-test method—Ogle (643) measured spelling achievement in 135 rural schools and reported that the schools using the test-study method surpassed those using the study-test method. Gates and Bennett (609) studied the temporal span of assignments, experimenting with ten groups of pupils in Grades II to VI, inclusive, during a period of four months. No significant difference between the daily and weekly lesson plans was found.

Style of handwriting—Cutright (598) made a study of written composition in which second-grade pupils using manuscript writing were reported to have excelled matched pupils using cursive writing, both in extent of vocabulary and in accuracy of spelling.

Use of a dictionary—A "progressive" teacher (650) met the need for dictionaries during the creative-writing period in a third grade by preparing a word book from available word lists for Grades I to VI. Kelley (626) offered suggestions for training pupils in the use of a dictionary. Neither report is quantitative in character.

The principle of generalization—Within the last ten years there has been a marked increase of interest in the possibilities of generalization as a methodological principle in elementary-school instruction. This is indicated by the number of objective studies that have appeared. In a recent

monograph Gates (612) presented the results of two elaborate controlled experiments on the use of rules and the grouping of words according to orthographic and phonetic similarity. Three thousand, eight hundred pupils and 106 classes were involved. Gates concluded that such a program of generalization, "while it does not increase ability to spell the words studied, . . . does tend to increase to some extent the power to spell new words and especially to handle the specific derivatives and other elements to which the generalization program was especially directed." Breed (588) sketched the history of the problem of generalization and endeavored to interpret the results of the leading experiments thereon to date. A bibliography of 39 references was supplied.

Gilbert (614, 615, 616) continued his studies of transfer of training from reading to spelling. He found that the ability of ninth-grade pupils to spell a list of words was favorably affected by the presence of the words in reading matter previously covered by the pupils. Later it was found that the spelling achievement of pupils improved from year to year in high school without specific training in the subject. Further study of the problem showed that results are similar at still higher levels of instruction. These findings suggest the question, To what degree are elementary-school pupils indebted to incidental methods for achievement in spelling? The educational "progressives" and their opponents should both welcome an answer. Since English schools rely much more than American schools on the incidental method in this subject, a comparative study of achievement in English and American schools might help to obtain an answer. Douglass and Kittelson (601) studied the effect of Latin on English spelling. Two years of Latin showed no effect. Pupils, however, who had studied Latin three to four years were reported as reliably superior to equated non-Latin pupils, in spelling Latin derivatives in English.

Difficulty and Misspelling of Words

After comparing the misspellings of college freshmen with those of seventh- and eighth-grade pupils, Garrison (608) published a list of 131 words most frequently spelled erroneously by both groups. Later Garrison (607) presented a list of 155 high-school spelling "demons." More detailed information should be given in regard to the method of selecting this list. Wise (661) provided difficulty values for 1,102 words found in a list of 3,630 words common to eleven or more spelling books but not found in recognized spelling scales. Gates (611), on the basis of extensive testing, determined the points of special difficulty in the list of 3,876 minimal words previously referred to. "Nearly three-quarters of the words (72.5 percent)," said Gates, "revealed one and only one definite hard spot." Concerning "hard spots" in words, two problems seem important: (a) What are the facts regarding their existence? (b) How shall they be treated in the teaching process when found? Gates's findings obviously are related to the first question. Ashbaugh (585) raised the

question, What makes a word difficult to learn? A spelling scale indicates percent of correct spelling, but, he says, "we know . . . nothing from that fact regarding the difficulty of learning." Perhaps he would favor an experimental method of determining the difficulty of words similar to that used by Knight and his co-workers in determining the difficulty of primary number combinations.

Disability and Remedial Instruction

In a detailed psychological study of 105 cases of spelling disability among children, Schonell (646) found that 6 percent were also cases of defective speech, including such defects as organic malformation, paraphemia, dysphemia, habitual "thick speech," and ordinary mispronunciation. Remedial procedures were described and results reported. Schonell (644) also studied spelling disability among 598 educated adults. The number of cases identified constituted about 5 percent of the whole group, and were due, he concluded, to causes that were (a) temperamental, (b) intellectual, (c) sensory, and (d) environmental. Gillingham and Stillman (617), in a well-written monograph, discussed fundamental types of disability in both phonetic and unphonetic spelling, cited illustrations from case records, and outlined remedial procedures. Almack and Staffelbach (583) reported an experiment showing that spelling achievement may be improved by using an association technic to discover words whose spelling requires attention. According to their report, spelling errors in later compositions were reduced by this method about 2 percent. W. H. Gray (622) concluded, as a result of an experimental investigation, that while there was some evidence in favor of learning to spell in a state of hypnosis, the difference (1.92 percent) on the side of hypnotic learning was not great enough to warrant a widespread use of the method. A two-year study of deficiency in Grades VII, VIII, and IX was made by Belleau (586), in which the average percent of spelling error was reported to have been reduced from 20 percent to 6 percent by regular instruction with the use of a nationally known spelling text. An attempt to meet a similar situation in a vocational school was described by Morris (636). The remedial work was based on a list of 1,800 words accumulated from the misspellings of pupils. An article written by Steadman (651), based on a ten-year study of verbal taboos, furnished important data on types of words avoided because of uncertainty regarding spelling.

Construction and Validation of Tests

The studies in the field of measurement are descriptive of new tests that have been constructed, and contribute data on the validity of tests of several types. Schonell (645) made a theoretical psychological analysis of the spelling process, as a result of which he concluded that memory, phonetic analysis, auditory discrimination and recognition are the fundamental activities. He then designed a set of diagnostic tests for the discovery of deficiency in these activities. Davis and Schrammel (599)

constructed a context test in two forms for Grades II to VIII. The test seems suitable for group measurement, but too short for the measurement of individuals. Its validity and reliability were not reported.

Breed and Carpenter (591) constructed a test in two forms that can be administered without the dictation of the teacher. It is designed for Grades II to VIII, inclusive, and is provided with norms and validation data. Results on the discrepancy between the content of a standardized test and that of a course of study were reported by Dewey (600). The value of a standardized test for the comparative measurement of schools was not touched upon. Weller and Broom (658) reached the conclusion that the column-dictation and sentence-dictation spelling tests still seem to yield the most valid measures of spelling achievement. Their results should be studied in comparison with those of Cook, referred to in the previous triennial summary. A study by Nelson and Denny (640) "indicates that the multiple choice test has more merit than it has been found to have in other studies." The difference in results, the authors suggest, may be due to differences in procedure. Northby (642) compared scores on the same words for the same pupils from five different types of spelling tests. A question may be raised regarding the use of difficulty as the criterion of validity.

General Discussion and Evaluation

The first three contributions in this group of studies are the most comprehensive in scope and represent attempts to cover the major issues in the field of spelling. Foran's book (605) and the study by McKee (633) were published in the same year. The discussions in each case are extensively documented with references to scientific literature. The work of Bhatia (587) is essentially a handbook for teachers of English spelling in India. Aside from Rice and Cornman, it makes few references to American investigators. Cole (593), in a well-written chapter, offered numerous suggestions for the teaching of spelling. In a general article Foran (605) briefly presented the principles of instruction which he regards as fundamental. Freeman, Gray, and Breed (606) indicated some of the outstanding features of spelling instruction in the primary grades. Eymard (602) discussed the difficulty of spelling for the blind and suggested teaching procedures based on experience with such pupils. In the light of findings in recent investigations, Gates (612) discussed the gradation of words, the principle of generalization, word-list versus word-study programs, points of special difficulty in words, and the possibility of reducing the amount of formal instruction in spelling. Woody (662) answered "several of the questions most frequently asked with regard to the teaching of spelling."

The remaining references are to more objective contributions whose classification is determined by the variety of topics with which they deal. Watson (657) conducted a study which extended through a period of eight years in elementary and secondary schools. Her monograph presented

data on vocabularies of pupils, spelling errors, diagnostic and remedial procedures, and various problems in methods of instruction, including the use of rules and the teaching of homonyms. Waterman and Melbo (656) described a set of criteria used by a state curriculum commission for the evaluation of spelling texts.

After the literature referred to in this section of the summary has been covered, one realizes anew that the facts in our possession may be used as the foundation for widely different hypotheses.

Problems for Research

There is need for more adequate data on the results of incidental methods of instruction, on forgetting and the maintenance of skill, and on the causes of spelling deficiency. Investigations of grade placement should be continued and the general problem of spelling reform should not be lost to view.

CHAPTER XI

Activity Programs in Nursery School, Kindergarten, and Elementary School

Josephine H. MacLatchy, with the cooperation of Katherine McLaughlin and Louis E. Raths [1]

Definitions of Activity Education

DEFINITION has an important role in research. For this reason, and because during the past three years educators whose opinions carry prestige have been describing, defining, and delimiting the function of activities in the school, it seems appropriate to mention some of these expressions. Articles of definition have appeared since July 1934, from the pens of Dewey (703), Kilpatrick (740), Bobbitt (675, 676), Freeman (708), and Bagley (670). The articles by Kilpatrick which appeared in the *Journal of the National Education Association* have been gathered in book form (741). The public discussions of the Thirty-third Yearbook of the National Society for the Study of Education were published in *Progressive Education:* Brim (679) discussed basic realities; Gray (714), controversial issues; Kilpatrick (739), the essentials; and Whipple (795) expressed an adverse view.

Several books bearing in their titles the word "activity" or some of its variations have appeared during this three-year cycle. Hanna and others (720) assembled an unusual array of real instances in which young people have served their communities. These records are not the statements of ideal activities, but they are accounts of what has been done. The yearbook of one organization has been devoted to integration, and portions of several others have been devoted to activities; but their contents have been mainly accumulations of opinions, and since the interest here is appraisal, mention of them is not included.

Three bibliographies have been published. Geyer (712), from a compilation of published discussions, attempted an interpretation of the activity movement. Irwin (759) gave a short bibliography on activities supplementary to his portion of the educational catechism recently prepared for Michigan teachers. Mossman (761) compiled a bibliography as a byproduct of her work as editor of the Thirty-third Yearbook.

Assumptions Accepted in Studies of Activity Education

Theoreticians of the activity movement give unusual emphasis to the assumption that participation in purposeful activities brings about such

[1] The portions of this report dealing with the nursery school and the kindergarten were prepared by Katherine McLaughlin. The discussion of assumptions was prepared by Louis E. Raths. The rest of the material was compiled by the chairman of the committee.

changes or growth in character and personality that boys and girls become better able to adapt their developing abilities to meet their changing needs and interests. In general, the assumption that particular kinds of activities are better than some others for bringing about these changes, is only one in a series of such postulates.

By and large, the proponents of the activity approach believe that the responsibility of the school is to meet the needs, the interests, and the abilities of the boys and girls who are enrolled. In general, it may be said that these same endorsers of the activity method have not carried on careful investigations in the hope of isolating the particular needs, interests, and abilities which boys and girls, at different ages, have; wherever needs are spoken of, they seem to be *assumed*.

Instead of investigating needs and instead of directly attacking the problems of meeting those needs, most of the persons concerned with the activity movement have directed their attention toward the problem of developing character and personality among their students. They have done this on the assumption that the function of the school is to develop boys and girls who will be able to meet their own needs as these emerge, change, and develop in the society of which they are a part. In other words, they believe that if opportunities for growth in certain aspects of character and personality are emphasized and if that growth takes place, children will be developing resources for meeting present and future needs and interests.

The crux of the measurement program, as far as the activity movement is concerned, therefore lies in the success with which changes in character and personality can be measured; moreover, the evaluators in this field must demonstrate that the changes which do take place may be thought of as being *influenced* or *caused* by the activity program in which the boys and girls participated. Obviously, this calls for a type of experimentation which involves careful study of relationships between certain elements of the inaugurated program of activities and changes which take place in character or personality. Where "controlled" experiments are carried on, we should expect the investigators to give some evidence that the control factors are indeed related to achievement of growth or change in character or personality.

In the report of all the studies which follow, the reader should be critical in these two respects: (a) Is the measurement program concerned with evaluating changes that take place in character and personality? and (b) Are the reported conclusions the outgrowth of carefully selected control experiments, where the control factors have been shown to be highly related to achievement in the factors measured? This is not to say that every study in the field should make a contribution to the evaluation of these characteristics. There are studies planned with a definite purpose of exploring the field, of discovering problems, and of raising questions which need further investigation. It is obvious, however, that

these types of studies conclude with questions and not with generalizations about the effectiveness of the activity program. With the exception of these so-called exploratory studies, it is reasonable to apply these two criteria to all the investigations in the field of evaluation. With these two principles in mind, readers are well armed to judge the value of the studies reported in the following pages.

Technics Used in Appraising Outcomes of Activity Education

Among the writers attempting an appraisal of activities in education there is unanimously adverse criticism of the available instruments of measurement as a means of appraising the results of the now rather commonly designated "newer type" schools. Such schools comprise all variations of educational coloring from those just off drab to the brilliant plumage of the most "progressive"—from schools which vary from traditional practices by the use of integration and the like to schools using projects, unit-activities, and complete freedom from prescriptions of subject-matter.

Observation records—During these three years the use of observation and diary records has been increased because of the lack of tests allowing objective appraisal of mental and social attributes other than the accumulation of information. Many of the theses which have appeared are based upon data gathered by some variation of the observation and diary methods. The reports of some of these investigators are circumstantial and casual; others have safeguarded observation by definitions which have indicated what types of facts were to be included and what were to be excluded. Some of these studies (686, 717, 743, 755, 769) were not available for examination by the Committee.

Among the theses in which unchecked anecdotal or observer-diary methods have been used, are some exploratory studies which have attempted to make explicit certain phases or aspects of activity education; for this reason they are mentioned here. In the study of the selection, use, and care of tools and materials in the elementary school, Chamblin (688) attempted, by contrasting the use of tools in standard schools with that in an experimental school of the newer type, to determine the implications to be found in the newer methods. Cooke (692) studied conversation as an index of human relations in children's education. Hilbert (725) sought the educational values to be found in the discussion periods in the intermediate grades when organized for unit studies. Dunn (705) looked for the educational potentialities to be found in the possible experiences, materials, and other resources which are available for use in schools. Parsons (768), from the examination of particular school situations, found language learning an integral aspect of all school activity. Barthlow (671), after a survey of the blocks of different sorts used in schools, described the educational experiences gained by the children in the use of a specially devised set of blocks.

Tate (783) in his study of the project method compared the achievement of an experimental and of a control group. He employed a variation of the defined observation methods in his use of the teachers' answers to questionnaires.

Byington (684) searched the literature for elements of pupil activities which should be characteristic attributes of progressive methods of teaching. From these she set up an activity checklist, the items of which she validated and then used in her observations in five progressive and five conventional fourth,- fifth,- and sixth-grade classes.

Pistor (770, 772), using the judgments of experts, distinguished trait-actions which he differentiated by definition. These definitions were used by observers who appraised two groups of fifth-grade pupils—one had attended a progressive school in Grades III and IV; the other had had no progressive-school experience until Grade V.

Wrightstone (801), in his comparison of the achievement of children in the elementary grades of "traditional schools" with that of an equal group of matched children from "newer type" schools, devised means of measuring group discussion and planning by controlled-observation technics. This method (802) provided a quantitative value for the frequency of certain defined types of pupil behavior. He further revised and supplmented his technic to include cumulative anecdotal records illustrating the quality of the defined categories of behavior, such as initiative, cooperation, and consideration.

Wrightstone (803) recently outlined for the use of elementary-school principals a scheme of appraising the extent to which certain educational objectives (764) are being realized in elementary situations. He defined each objective and suggested aproaches to measurement, mentioning whatever objective tests are available. He said: "New needs growing from new curricular practices in elementary schools have created demands for new tests. The tests . . . show certain major tendencies. First, they are built upon a functional analysis of pupil activities and of the curriculum. Second, the new tests tend to disregard and cut across the conventional subjectmatter lines."

A few criticisms and appraisals of the observational methods were found. Bott (677) reported an analysis of observational methods. He concluded that in social studies of young children the overrefinement of categories is a mistake; that the time-frequency method, with a 5-second time unit, is desirable; that the comparison of direct with indirect observations is one of the best measures of consistency in this sort of investigation; that factors of reliability in order of importance are validity, constancy of data, and reliability of observer. There is evident a need for the adoption of uniform procedures and for distinguishing fundamental problems.

Diary records—These are increasing in importance in the appraisal of the results of activity methods, and may be one of several types: a summary

of a unit, a detailed account of the work of the group, and records of individual children. Burke and others (683) summarized certain typical units of experience in the four-year and the five-year kindergarten and the first grade of Horace Mann School and indicated the differences in presentation introduced to meet the needs of the children's advancing maturity. Leining (745) gave a day-by-day diary record of a science unit in a fourth grade of Lincoln School from October 28 to April 22. She mentioned the activities engaged in during the day, the materials used, the questions raised, the means devised for answering the questions, individual pupils' contributions, and the like. Harap and Mapes (721) listed the 27 processes which are involved in decimals and on which they tested their pupils' knowledge. Leining (745) also listed the items of scientific knowledge mentioned by the pupils of the experimental and control groups in their essays and interviews as "evidence of learnings."

The diary accounts of individual children of the anecdotal sort were mentioned by many experimenters, but none presented a record. Giles (713) described twelve devices of record-making of the diary sort which he had employed in an experimental school. From the Eight-year Study of the Progressive Education Association came a mimeographed booklet which discussed the diary records for secondary-school students (704) and which, although it is outside the field of interest here, so clearly made explicit ways of gathering information which other writers have said they attempted to use, that it is included. These forms include the Record of Creative Expression, Personal Pattern of Goals, Record of Significant Experiences, Reading Record.

Zyve (805) suggested the need of evaluating projects within the individual group, school, and system. One device she used was to have the pupils in 141 rural classrooms, 145 suburban classrooms, and 204 city classrooms list at their teachers' requests "the things we have done in our room since school started." She classified the activities under several categories. She found that without any measure of time or evaluation of quality still the method indicated the areas of children's school experience and allowed for informal evaluation.

Variety in measure—The need of a variety of measures is repeated again and again. Leining (745) used a general test at the beginning and end of her study, as well as an essay test, an objective test, and an interview. Adams (663) found in the replies to the questionnaire, devoted to the problems of initiating an activity program, that 77 percent of the responders were of the opinion that the results of an activity program should be judged by observation of pupil activity, objective tests, and tests devised by the teacher. In the experiment with activity methods which New York City (746) began last year, and which is to continue for several years, the types of evaluation proposed are to include tests by the teacher, objective tests, reliable codes of observation in areas which cannot be tapped by pencil-and-paper tests, a measure of each pupil's home and community, and a device to appraise the extent to which the school is an activity school.

Results of Activity Education

From this discussion of technics we turn to the consideration of the results of activity methods in the nursey school, kindergarten, and elementary school. In nursery school and kindergarten all learning is through some form of activity. Subjectmatter does not seriously bid for a place until the beginning of the elementary school. Here the demarcation between traditional and newer type practices becomes definite.

Development of Social Behavior

Bradbury (678), in a review of research, concluded that children with nursery-school training were more independent, self-assertive, and self-reliant than those without such training. Thom (784) pointed out that "if generations of children were permitted to enjoy during preschool years an environment that fulfills their physical, intellectual, and emotional needs . . . [we] have reason to believe that a greater sense of security in all personal relationships might be attained which would result in harmonious adjustments to parents, contemporaries, and authority, and develop a confidence in self as a result of personal achievement and adequate recognition."

Jones and Burks (736) analyzed research contributions dealing with personality development. These included studies of developmental stages of behavior, variables related to individual differences, organization of personality and problems, and methods in the study of personality development.

Mallay (752) found that attendance at nursery school increases social and group contacts and develops technics which elicit successful contacts. Hattwick (722) substantiated these conclusions, but found that the influence differs at different age levels: three-year-olds profit more from compliance with routine, while four-year-olds gain in social adjustments and habits of work. Mallay (752, 754), analyzing patterns of social activities, found five basic items, namely, visual regard of each other, verbal statement, physical contact, parallel activity, and cooperative activity. She noted that increase in age gave increase in time spent in social contacts, more cooperative activity and less physical contact, greater number of participants in each relationship, and greater sociability index.

Cushing (694) measured the effects of nursery-school training as evidenced at the kindergarten level. Hattwick (723) found that preschool children from homes reflecting overattentiveness displayed infantile withdrawing types of reaction. Children from calm, happy homes manifested cooperative behavior and good emotional adjustment. Hattwick and Stowell (724) found from the study of the records of 500 children in Winnetka public schools that children who are "babied" or pushed by their parents have more social difficulties and poorer work habits than children from well-adjusted homes.

Johnson (735) found that positive, unhurried, specific, and encouraging instructions were more effective than negative, hurried, and discouraging directions. McClure (747) studied the responses of 77 Minneapolis children, aged twenty-seven to seventy months; and she recorded for each, fifteen pairs of verbal instructions involving simple nursery-school and kindergarten tasks. In general, the results showed that employing requests, positive suggestions, and encouragement had best responses, although the difficulty of the task, its intrinsic desirability and the order of its appearance in the experimental situation sometimes proved to be "more important in determining the response than the form of instruction."

In the most complete and thorough study yet made of children's fears, Jersild and Holmes (730) analyzed these at different age levels, compared findings obtained by the use of different technics, described developmental trends, and studied factors in preventing and overcoming children's fears. In another study the same investigators (732) reported that, while with increase in age fears decline in frequency and overt expression, certain fears due to imagined, anticipated, and supernatural dangers show marked increase. Holmes (727) experimented with the elimination of children's fears through a modified technic of conditioning.

Koch (742) studied by the time-sampling method various mannerisms often regarded as evidences of nervousness. She reported that in children these cannot be traced to a single factor, but that intrinsic and extrinsic conditions are operative. Ricketts (776) noted that the tendency for anger decreases with age and that in the home manifestations are more often accompanied by crying, while in preschool they are characterized by pushing, pulling, and struggling.

Jersild and Markey (731) studied conflict situations and analyzed such factors as frequency, causes, methods, relation to age, sex, socio-economic status, size of play space, and role of conflicts in social adjustments. Dawe (697) observed 200 quarrels of 40 nursery-school children during free-play periods.

In an experimental study of ascendant behavior, Jack (729) reported the outstanding difference between an ascendant and a non-ascendant group was the presence or absence of confidence. Non-ascendant subjects, given training to develop confidence, showed relative and absolute gain in ascendancy as compared with initial rating (767). H. H. Anderson (665) found among preschool children that dominative behavior incites dominative behavior in the companion, and integrative behavior induces integrative behavior. Hanfmann (718) found that dominance patterns within a kindergarten group of ten five-year-old boys, when based on the expansion of personal power are relatively stable, but they can be modified by a strong interest in play. "Only the child who is interested in play as such, or in social play, becomes a real leader who is gladly followed by the other children. In every instance the social behavior of a child is part of a total structure including the interrelationship of the children

involved and the medium in which it takes place. It can be influenced and changed through changes in this structure."

Key and others (738) tried to determine the age at which nursery-school children are able to dress themselves and to evaluate such factors as time, encouragement, interest, intelligence, and attendance at nursery school. The subjects were 25 boys and 20 girls from nineteen to sixty-four months. A scale for measuring the dressing process was constructed. Results show that chronological age or maturation is of more importance than training. The correlations indicated that the fast dresser is usually the one who is more efficient and the one receiving fewer verbal aids. The findings as to the effect of the more systematic training to dress oneself in nursery school were not conclusive. Quantitative findings were verified by the children's remarks and the teacher's observations of the children's behavior while dressing.

Dawe (699) found that kindergarten training is more intent upon the improvement of the child's participation in activities than upon improvement in the product; the product, however, ranked higher than social behavior. Dawe (698) also found that increasing the size of the kindergarten group between the limits of 15 and 46 pupils does not reduce the amount of a story which the children retain, but increasing the size does cut down the percent of children who take part in the discussion, and lessens the total amount of discussion and the average number of remarks per child.

Arrington (669) reviewed research contributions dealing with the impact of environment on social and cultural development and called attention to need for analysis of social and cultural patterns and reliable implementation for securing observation data.

Several studies dealt with the technics of analysis of social behavior. Conrad (691) offered a statistical study of the ratings on the California Behavior Inventory of 30 preschool children on 231 traits; Berne and Kelly (673) studied the adequacy of time-sampling technics; Joel (733) presented a five-point rating scale for 20 behavioral situations; Van Alstyne, Hattwick, and Totten (787) presented a new rating scale for behavior and attitudes in which items are grouped (as determined by multiple-factor correlation) under cooperation, social consciousness, emotional security, leadership, and responsibility. Newsom and Vincent (765) analyzed character development goals into two levels, ultimate and immediate, and defined nine key traits under each goal. These were offered as a working list that is neither complete nor unchangeable. Two others (700, 762) presented studies of character traits of preschool children.

Wrightstone (801) indirectly appraised the dynamic factors such as, interests and attitudes in the primary grades. He concluded: "The fact that children's interests and activities are made the basis of the primary curriculum in newer-type schools is evidence itself that dynamic factors are primarily used. Attitudes which cannot be measured at the primary

level are, undoubtedly, the foundations upon which pupils' later attitudes are built." In the upper elementary grades these dynamic factors were evaluated indirectly by questionnaires on activities and on independent methods of work. The pupils in newer-type schools made greater use of trips to galleries, factories, and other places than did the pupils of the standard-type schools. They also exceeded the pupils of the standard-type schools in the additional classroom use of museum exhibits, movies, animals, and industrial arts tools. The pupils of standard-type schools employed with greater frequency cut-out-picture exhibits and slides than did the pupils of newer-type schools.

Class recitation and discussions were analyzed to show pupil and teacher performance. In the primary grades of newer-type schools, Wrightstone (801) found more frequent "opportunities for the development of pupil initiative by means of voluntary reports, real experiences, vicarious experiences, and pupil suggestions of the means, methods, or activities in integrated units of work" than in those grades of the standard-type schools. Through "assigned lessons and formal recitations of subjectmatter, the standard-type school places emphasis upon providing opportunities for memory."

In the upper grades of the newer-type elementary schools Wrightstone found "greater familiarity with independent methods of study" than in those grades of the standard-type schools. The pupils also had "more experience in consulting and using independently such sources of information as books, libraries, museums, art galleries, informed persons, newspapers, magazines, pictures, and similar facilities." An analysis of pupil performance showed that newer-type schools place a special emphasis upon providing opportunities for the development of pupil initiative, standard-type schools upon providing opportunities for memory through assigned lessons and formal reciting of subjectmatter.

Pistor (770) compared two groups of fifth- and sixth-grade pupils—the first had no progressive-school experience prior to Grade V; the second had had two years of progressive-school experience when they entered the fifth grade. He (771) developed an observation method of measuring by which certain trait actions were appraised by sets of observers in six typical school periods at recurring intervals. He found that both groups showed improvement, but that the more experienced progressive-school group showed the greater amount of growth in positive trait actions.

Tate (783) evaluated the project method by measuring the achievements of an experimental and a control group in Grades II-A, IV-A, and VIII-A. He attempted to make objective comparisons by the use of a variety of tests which he devised for the occasion. There were three types of tests: (a) those to measure academic achievement; (b) those to indicate the children's growth in interpreting experiences, making inferences, making comparisons, detecting differences, displaying interests, revealing leadership, showing initiative, appreciation, social consciousness; and (c) those

to measure the children's ability to recall the concrete objects and processes and to use them in abstract thinking. By the results of each of the three types of measures the children of the non-project groups were superior to those of the project groups. The children in the project groups engaged in more different kinds of activities than children of the control groups. The children in the project groups did not naturally run their projects into many other subjects allied to the one in which the project was based. They tended to terminate the project after attaining its original objectives.

Play

Alschuler and Heinig (664) in an analysis of play patterns pointed out that "ten or fifteen years ago" our chief consideration of children's play was largely in terms of occupations, while "today we are more concerned with having children develop ability to do things and to meet situations than we are with things they have made." Fewer directions and suggestions are given "because we have observed that, if children have proper materials and time and place in which to use them, they will initiate their own activities and will learn more in doing so than if they were told what to do and how to do it."

Rogers and Higgins (777) surveyed trends in selection of school equipment and supplies. Johnson (734) studied variation in the amount of play material in relation to the effect upon the behavior responses of three- to six-year-olds.

Cockrell (689) studied play reactions of nursery-school children aged two, two to three, and six with no adults present except an observer behind a one-way vision screen. She used four different play materials and four different settings. Each child was paired with another in the group and also observed when alone in the four different play settings. Measuring the holding power of each setting by the length of time that the child voluntarily remained with it, she reported that the best play situation was evidenced when all four types of play materials were combined; that clay and crayons ranked highest of single-type play material; pictures, books, and companions ranked next; housekeeping material ranked lower; and companions made the poorest showing. Depriving these children of all play materials forced them to attend to themselves more than to play with companions, thus manifesting the "individualistic" play pattern characteristic of these age ranges.

Manwell and Mengert (756), using repeated short observations from October to May, checked a list of twenty-seven activities at one-minute intervals every four days for 35 nursery-school children, and reported that three-year-olds made higher frequency scores in language, imaginative play, and group play; lower scores in manipulative play and watching others; and talked more in group play than when playing alone. Two-year-olds talked as much when playing alone as in group play. Both age groups increased their scores during the year in language frequency,

constructive activity, imaginative play, group play, and playing alone; they decreased scores in watching others.

Washburn and Hilgard (792) studied five aspects of play behavior involving varying degrees of social participation: O, observation without active participation; S, solitary play, engrossed in things to the exclusion of people; G, gregarious play, tolerated the near presence of others (at sandbox or slide) but were essentially engrossed in their own interests within the group; P, parallel play, engaged in a project similar to that of another (constructing with block or painting at easel) and exchanging ideas with another but each independently bringing his own project to completion; C, cooperative play, joining forces with two or three to complete a common project or to carry on dramatic play to which each contributes. These investigators found that all five degrees from O to C in the nursery-school groups range in age from fifteen months to five years. Increases in age and maturity showed developments from more individual to more social types of play. The failure to develop in the direction of more social types of play was suggestive of fundamental personality differences.

Fales (706), by use of a rating scale previously designed for the purpose, made a comparison of the vigorousness of play activities of preschool boys and girls. Previous studies indicated sex differences in choice of play materials. This was the first study to determine differences on basis of vigorousness of the energy expended. Fales found no significant difference between the scores of boys and those of girls. She reported much variation in scores within groups—more among girls than among boys, marked variations from day to day in both groups, and a slight tendency towards higher vigorousness scores for younger than for older children.

Vance and McCall (788), using the method of paired comparison of pictures, studied children's preferences among 48 specific play materials. They found order of preference for eight different classes of material to be as follows: plastic materials, toy animals, housekeeping materials, playground apparatus, large toys for active play, manipulative materials, transportation toys, and blocks. There is disagreement with previous investigations in that blocks are ranked as least preferred by age groups, sexes, and total groups. Roof (778), in a study of supervised play periods of I-B children in an environment of traditional play equipment, reported that sand was an outstanding choice of boys; swings and jump ropes of girls.

Guanella (715) presented a study of the block-building activities of a group of two- to six-year-old nursery-school children in which the threefold aim was: (a) to analyze developmental change into its component parts; (b) to study phases showing influence of maturation; and (c) to determine which phases may be studied best through diary records of free-play periods and which require the more controlled conditions of laboratory observation. Total development, due in large measure to matu-

ration plus favorable environment, consists of a number of factors which make their appearance first as relatively simple activities and later become coordinated at more mature stages into fairly complex activities. She identified eight factors and pointed out certain developmental phases in each:

1. Motor skill, that is, mere manipulation
2. Hand-eye coordination (at about ninety-seven weeks)
3. Language factor (about one hundred and ten weeks) when children begin to name their structures or to verbalize while building
4. Methods—from simple to complex, from non-structural or manipulative to linear, bidimensional, tridimensional and finally integration and elaboration of all these methods
5. Development of perception for space relations
6. Representative use of blocks—at first unrecognizable and non-functional in dramatic play, but later, more resemblance evident and used often in dramatic play; finally, in group aged four to seven, realistic interpretation appears as correct relationships are perceived
7. Dramatic play, coordinated with building activities develops (about one hundred and fifty-six weeks) with use of blocks for movable objects such as boats and trains.

Barthlow (671) summarized the answers received from 52 schools regarding their uses of blocks. Types, colors, sizes of blocks; structures frequently and others less frequently built from blocks in nursery schools, kindergartens, and primary grades; characteristics of block play which show growth in children for nursery school, kindergarten, and primary grades; and accessory materials were listed. She described a set of experimental blocks and listed from anecdotal records certain evaluating criteria.

Markey (757) studied imaginative behavior of preschool children. She found that activities characteristic at younger levels are superseded by different types of activities at older age levels. Imaginative naming and personification of objects are dominant at the three-year level, but beyond this age interest in using raw materials in constructive ways for dramatic play and elaborate imaginative situations becomes more frequent.

Learning, Language, and Subjectmatter Learning in Young Children

Wenger and Williams (794) reviewed ninety-nine titles dealing with studies on learning in young children under the following topics: conditioning of emotional or affective responses, skill, associative learning, discriminative learning, problem solving and factors affecting learning. Nelson (763) analyzed ability to substitute rational learning for trial-and-error learning in a group of 67 children with an age range of from twenty-eight to sixty-four months. She found that children as young as three years showed ability to eliminate logical errors, thus using a method of learning termed rational for adults. Bestor (674) studied attention in two groups of nursery-school children of high and low socio-economic status. To differentiate between attention and interest activity she selected

meaningless material for tests and reports: (a) a lack of relationship between visual and auditory scores; (b) differences between groups in all scores; (c) no significant variations in scores for attention based upon time spent; and (d) individual differences within groups as more significant than developmental factors.

H. H. Anderson (666), using three types of motivation for improving ability in simple functions, in age groups from two to eight years, found that (a) irrespective of success or failure, a definite goal with possibility of knowledge of results aids learning; (b) initial efficiency was maintained much better by success conditions, while performance under failure conditions showed a precipitate drop such as would be expected under either a swift onset of fatigue or a quickly waning interest. Woody (798) found that difference in learning response between bright and dull groups is one of degree rather than kind. The dull children tend to respond like the bright, except that they are slower. Dashiell (695), subsuming all theories of learning under three headings—trial and error, conditioned response, and Gestalt, pointed out that motivation must be present, regardless of which theory is accepted. Defining *motive* as the reason that an act is performed, and *motivation* as purposeful presentation of adequate and fitting motives that stimulate the "will to learn," Kelly (737) pointed out the importance of direction and development of the child's interests and efforts by tasks adapted to his maturity and experience.

Mallay (753) and McGeoch (749) studied memory span of preschool children. The former reported that verbal direction during demonstration of simple manual tasks facilitates memory. Shacter (780) found a fairly high correlation for preschool children between ratings by teachers in the Marston scale and the test results of sustained attention in nursery-school children.

Several studies analyzed the relation between environmental conditions and intelligence. Wellman (793) presented data indicating that while intelligence quotients of children enrolled in the preschool at the University of Iowa laboratories show a fairly marked increase during the period of enrolment, this tendency to gain was not maintained after transfer to other schools. Coffey and Wellman (690) studied the problem of whether children of parents of different cultural status showed any significant differences in changes in intelligence during preschool attendance. In general, findings indicated that cultural status as measured by the occupation of the father and the educational level of the parents, while related to intelligence of the children entering preschool, was not a significant factor in changes in intelligence, after a given period of attendance in preschool. Amount of gain was contingent upon intelligence level attained when the child began his preschool career, irrespective of his cultural status. Skeels (781) studied 73 children in foster homes for periods of one to five years. The mean chronological age at the time of placement was 2 and 5 years. His findings to date seemed to indicate that the mean level

of child intelligence is higher than would be expected for the child coming from the educational, socio-economic, and occupational level of his true parents; no relation appears between intelligence of the true mother and that of the child; and judging from the few cases available at older preschool ages, the possibility of a relation between the child's intelligence quotient and the foster father's occupational status seems to be indicated as the age of the child increases.

J. E. Anderson (667) evaluated previous studies that show child behavior as definitely limited by structure, developmental level, task limits, and relation of individual to environment. Development and learning alike involve a sorting of both stimulus potentialities and response potentialities in the organism with relation to its environment. In the early stages the individual reacts to a large variety of stimuli with a variety of responses. As development and learning proceed, some of these responses are sorted out so that ultimately the stimulus field becomes one of detail. Parallel with the process of differentiation, there is going on in the individual the process of integration or "recombination" of responses as an outgrowth of experience. Complexity of the integrating or reorganizing process is directly dependent upon the degree of differentiation which has taken place.

Language of Young Children

Smith (782) studied some factors influencing sentence development in children ranging in age from eighteen to seventy-two months. The group represented high average intelligence drawn from all classes of society with a larger proportion from the upper social class than is found in the general population. The children came from homes where English was the only language spoken. Records included two types of situations: those secured while the child was engaged in play with other children (Situation C); and those taken when the child was alone with adults in his own home or another home with which he was familiar (Situation A). In neither case was the child addressed by the experimenter. Using the mean number of words per sentence as a measure of the development in language, it was found that the average in Situation A was consistently higher than those in Situation C at each age level. The difference was "statistically significant at four and five years as well as for the whole series." The investigator considers sex differences, sentence construction and function, parts of speech, errors, mental age, social classes, order of birth, and relation of sentence length to size of vocabulary. Her conclusions state that (a) the average number of words per sentence and the average errors per word give most useful criteria of improvement; (b) though improvement is related to chronological age, a more important factor is mental age; (c) sex differences are slight except at two years when girls excel boys; (d) association with adults tends to improve speech more than association with children; (e) children of higher social classes are more precocious in language development than less favored groups; (f) order

of birth has slight if any influence; (g) sentence length is indicative of the size of vocabulary.

Fisher (707) found that, in age groups of two to five years, the child talks more and more about other people but not at the price of leaving himself out of the picture. The increase in the number of other persons closely parallels an increase in the number of commands issued and questions asked. Voegelin and Adams (789) by means of a picture test, so planned as to elicit most of the sounds common to English usage, studied the relative difficulty of pronunciation of various speech sounds for a group of nursery-school children.

Davis (696) studied the mean sentence length compared with long and short sentences as a reliable measure of language development. She reported that "group differences are constant, whether the longest sentence, the mean of five longest sentences, or the mean of fifty remarks is employed as the measure of language development." She concluded that the mean of the five longest remarks will prove for most purposes fully as satisfactory a measure of language development as the mean of fifty remarks.

Uhrbrock (786), by means of a dictaphone, recorded the vocabulary of a child for six weeks preceding the fifth birthday. Olson and Koetzle (766) found that kindergarten children (191 words per minute) talk somewhat more rapidly than nursery-school children (182 words per minute), but the total verbal output of the former was slightly less than the latter. The individual differences were numerous. Fuller (709) studied over a four-year period the effect of kindergarten speech training on primary-grade progress of children who came from homes in which some foreign language was spoken. Wilson (796) investigated the contribution of the kindergarten and first grade to creative literary art. She evaluated 226 original compositions for variety of ideas, readiness and ease of language, simplicity of expression, and esthetic feeling. J. E. Anderson (668) presented an analysis of indexes of linguistic development.

Brown (680) found from stenographic records of 27 periods set aside for informal talking that fourth-grade children tend to talk freely and at length when given an opportunity to tell something they wish to tell; they prefer personal experiences as topics for conversation; and they tend to use words which fall within the first two thousand words of the Thorndike word list. Dawson (700) found that pupils in Grades III through VI of 24 schools when talking without the guidance of an adult like to talk about their games and pets, their own unusual experiences, experiences of their relatives and friends, and trips which they have enjoyed.

Reading of Young Children

Gates (710), in a study of the mental age necessary for beginning reading, found that with some methods a mental age of 5.0 is sufficient to learn to read. He also obtained data which "indicate clearly that statements concerning the necessary mental age at which a pupil can be interested to learn to read are essentially meaningless. . . . The most significant

finding is the fact that the correlations between mental age and reading achievement were highest in classes in which the best instruction was done and the lowest in those in which the poorest instruction was provided. . . . The study shows that the determination of the optimum mental age and other factors in reading readiness is not so simple as some recent pronouncements imply."

Castner (687) described a clinical method for selecting children likely to prove handicapped in learning to read before they start to school. It is based upon observation of the presence or absence of certain traits brought out in the ordinary routine of the clinical examination, thus requiring no additional testing. Significant factors were: (a) "scattering and inconsistency of the individual developmental examination," (b) "inconsistency of results on successive examinations," (c) "specific weakness on drawing tests," (d) "sinistrad or other atypical directional tendencies in drawing, or tendency to reversal in making letters and numbers," (e) "history of sinistrality in child or family," (f) "history of reading disability in siblings of parents," (g) "atypical factors in speech development," (h) "unstable or excitable personality."

Lee and others (744) listed 20 items in a rating scale for the use of kindergarten teachers, in which the items are ranked according to the degree with which they discriminated between pupils who in first grade were the best and the poorest readers. Cantor (685) found that a regular program of excursions for kindergarten children is an aid to them as a basis for primary reading.

Wrightstone (800, 801) found that the skills in language usage and reading of primary-school pupils in newer-type schools were superior to those skills of pupils similar in grade, intelligence, age, and socio-economic status in traditional schools judged by scores on the Metropolitan Achievement Tests. The superiority had statistical significance. The records of the pupils in the upper elementary grades were slightly superior, but the differences were not statistically significant. Bruene (682) found that the pupils of an elementary school using activity procedures read somewhat better when judged by scores on the Stanford Achievement Test, did somewhat better on spelling, and markedly better on language usage than the general school population judged by the grade norms for the test.

Pistor (771, 772), in reading, language, and literature, found that two groups of fifth- and sixth-grade pupils in progressive schools made better average scores than did the pupils in traditional schools, both groups improved in their ability as the experiment continued, and the group with longer progressive-school experience made the greater gain.

Gates and Bond (711) told of the work with groups of dull-normal pupils in Grades II to V in Speyer Experimental School in which an activity program arranged to give special attention to the development of competence in reading was devised. Scores on the Modern School Achievement Tests showed average improvements of .38 of a grade from February to June in all subjects but reading, while in reading all the classes but V-B exceeded their grade-placement.

Arithmetic of Young Children

Young children learn slowly and gradually to interpret visual impressions of relationship between objects in space; furthermore, as has been shown, perception of differences in size and form of objects doubtless excels ability to indicate discrimination. Several earlier studies have sought to determine a child's concept of size through studies of form perception, recognition of relationships, and discrimination of relative sizes. Thrum (785) investigated development of concepts of magnitude; that is, the development of idea of big, little, and middle-sized, irrespective of the particular sizes presented. Where the big one was requested 88 percent of choices were correct, 68 percent when the little object was requested, and 48 percent when the middle-sized was requested. Results indicated that more children were familiar with idea of big in relation to other two sizes presented than with idea of little or middle-sized. Age distribution of errors, order of presentation, and forms used seemed to have slight influence upon accuracy of selection. Throughout the tests middle-sizedness proved much more difficult than big- or little-sizedness. She concluded that concepts of magnitude are present among some three-year-olds who may evidence instability in perceptual reactions to varying relations between sizes of objects; the inaccuracy in response to some situations does not indicate the absense of the concept of size (this is indicated by the large percent who made correct responses in selecting largest object though in another series that same object may have been smallest); perception of relative differences in size is less accurate for smallest objects than for biggest. The perception of middle-sized relation, in which children must perceive that one object is smaller in relation to another objective though it is correspondingly larger than the third object, is not a well-developed concept at the ages studied. Some children under five make correct responses in situations demanding perception of intermediacy. Below three years there is a tendency to make the same selection which seems to indicate failure in interpreting instruction. It is evident that some three-year-olds have formed concept of magnitude.

Other studies dealt with various aspects of arithmetical ability such as beginning counting ability in the three- to six-year level (751); counting and combining numbers at kindergarten and first-grade level (750); concepts of simple unit fractions (773); and ideas of *more, less, many, equal,* and *same* in the four- to eight-year level (779). From experimental data Russell (779) concluded that the child's first concept of number is a *manyness* from which the quantity and serial aspects of number differentiate. He reported that differentiation is a gradual process, but that at seven years, concepts of *most* and *more* are fairly stable but those of *same* and *equal* are not firmly established. Reid (775) recorded incidental number situations in first grade for a period of three months and reported that concrete uses far exceed abstract uses in day-by-day activities; the use of rational rather than rote counting is marked; the use of addition is

far more frequent than subtraction; when the "meaning factor" is clear, larger numbers are readily handled; and the fractional concepts are infrequently used. Wulfing (804) reviewed 22 studies dealing with maturation in arithmetical ability.

An analysis of the general principles of psychological readiness points to the significance of the meaning factor in number learning. McConnel (748) dealt with this factor in a controlled experiment in the learning of 100 basic addition and 100 basic subtraction facts in second grades of a city school system testing the relative effectiveness of two procedures in learning. Method A stressed primarily repetition of stimulus, response connections "authoritatively identified" with no attempt at investing number combinations with meaning. In Method B number combinations were identified by pupils' active process of discovery and verification, in which learning became a meaningful, relational, and insightful process.

Brownell and Chazal (681) analyzed the "meaning" theory for teaching arithmetic as contrasted with the "drill" and the incidental theory. Hanna and others (719) concluded that the activity program does not provide sufficient experience to enable the child to get the arithmetic which is necessary in the present social order. Activities are useful, however, in giving meaning to numbers.

Harap and Mapes (721) taught decimals using 13 socially real units among which were making toothpaste, ink, furniture polish, paste, and hand lotion; school banking; and keeping spelling records. By these methods the 39 pupils in a Cleveland public school learned 96 percent of the basic 27 processes involved in decimals. The authors believed that mere repetition does not seem to be an important factor in the mastery of any process.

Benezet (672) told of an experiment in which pupils had only practical experiences of arithmetic during the first five grades followed by formal instruction in the last three grades of the elementary school. Fine progress, which in the opinion of the author far exceeds the usual progress in these grades, was reported, but the progress was not objectively measured.

Brownell and Chazal (681), in an experiment dealing with the effects of premature drill in third-grade pupils, found that drill makes little, if any, contribution to growth in quantitative thinking. Deans (702) and Quattlander (774) studied effectiveness of "meaning factor" in second-grade arithmetic. Other studies analyzed the effect of number forms (760); integration of reading and arithmetic (716); computational arithmetic in social experience of third-grade pupils (790); tests for number readiness (726); and survey of current practices (758).

Pistor (770) compared the academic achievement in two groups of fifth- and sixth-grade children—the first group only had experience in progressive methods in those two grades; the second group had attended a progressive school in Grades III and IV as well. The results of these groups on the subtests of the Stanford Achievement Test were somewhat

better than the average for pupils in traditional schools, while the achievement scores of the second group were better than those of the first group.

Wrightstone (801) found that in lower elementary grades and in the upper elementary grades the pupils from newer-type schools made slightly better records in the arithmetic test but, since the groups were small, he concluded that "the newer-type practices are as adequate a medium as standard-type practices." Bruene (682) found that the scores of the children in the University-Elementary School, University of California at Los Angeles, fell slightly below the norms in Grades III, IV, and V in the arithmetic computation of the Stanford Achievement and somewhat above the norms in Grades VI and VII. In no grade did the medians fall below in arithmetic reasoning.

General Studies

Leining (745), in her report of a science unit in fourth grade at Lincoln School, gave a diary record of the unit and described other aspects of the educational experience. The records of the children of the experimental group were compared with those of children similar in grade level and intelligence, on two general tests, an essay test, an interview, and an objective test on specific learnings. The two control groups had science work similar but not identical with that of the experimental group. On the general test and on the essay test the greatest growth was shown by the experimental group. The results of the interview supported the results of the tests by showing that the children of the experimental group possessed a great number of science "learnings" apparently due to participation in the project.

Crawford and Hale (693) concluded that activity methods used with experimental rooms (Grades VI and III and IV-B) fully justified themselves as means of teaching when compared by scores on objective tests with the record of the control rooms taught by formal methods. When compared with the norms for pupils in the general school population of the country, Hopkins and Mendenhall (728) found that the Lincoln School elementary pupils on the average were younger in age, had a higher intelligence quotient, and achievement quotient, when measured either by the old or new Stanford Achievement tests. The median scores of these Lincoln School pupils were slightly inferior to those of the pupils in sixty-six independent schools, some of which closely resembled Lincoln School in educational organization while others were more conservative in practice.

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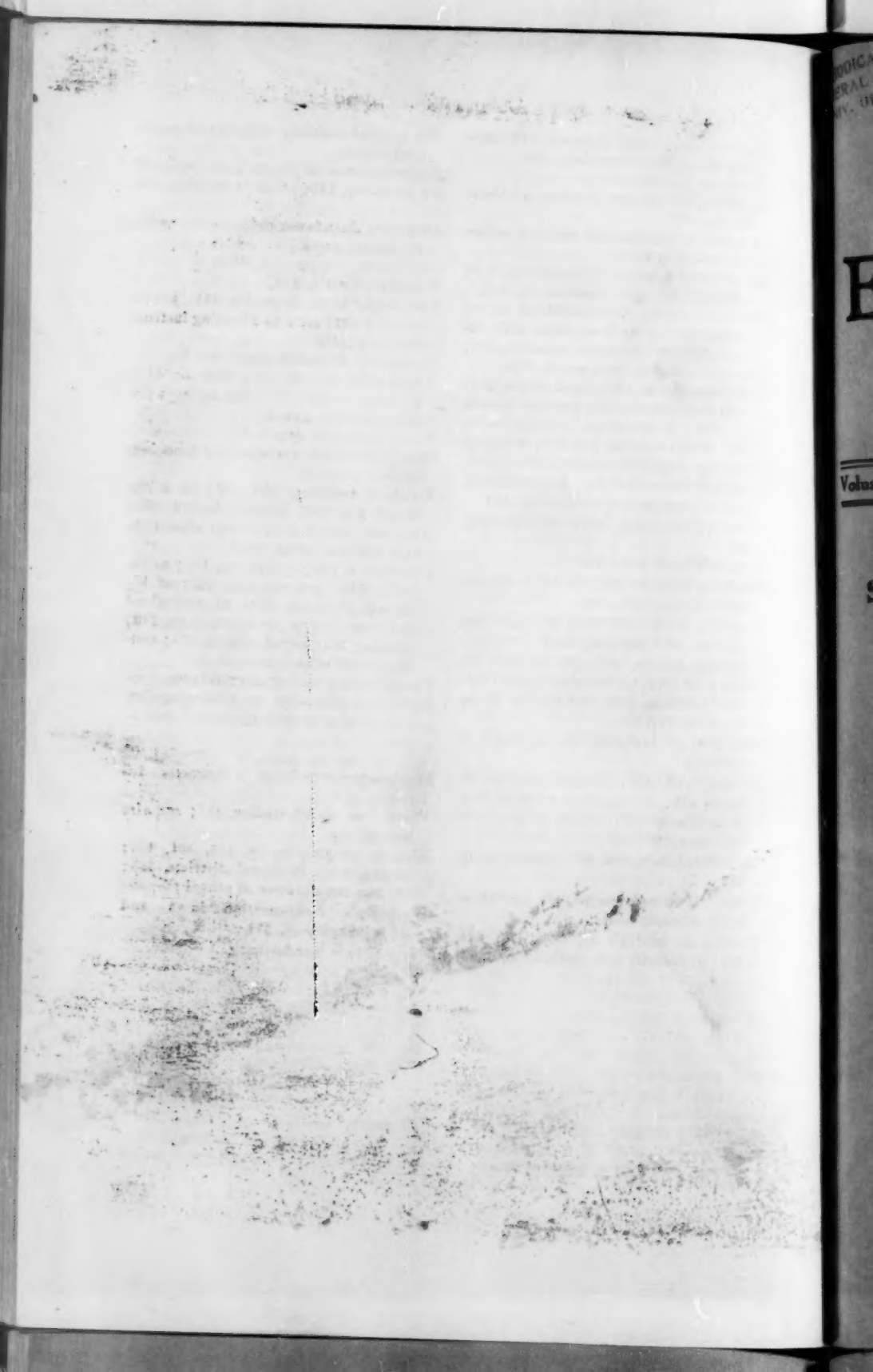

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SPECIAL METHODS AND PSYCHOLOGY OF THE ELEMENTARY-SCHOOL SUBJECTS

Reviews literature from July 1, 1934 to July 1, 1937

Literature of earlier periods was reviewed in

Vol. V, No. 1, February 1935
Vol. I, No. 4, October 1931
Vol. I, No. 5, December 1931

For issues treating related subjects see inside back cover.

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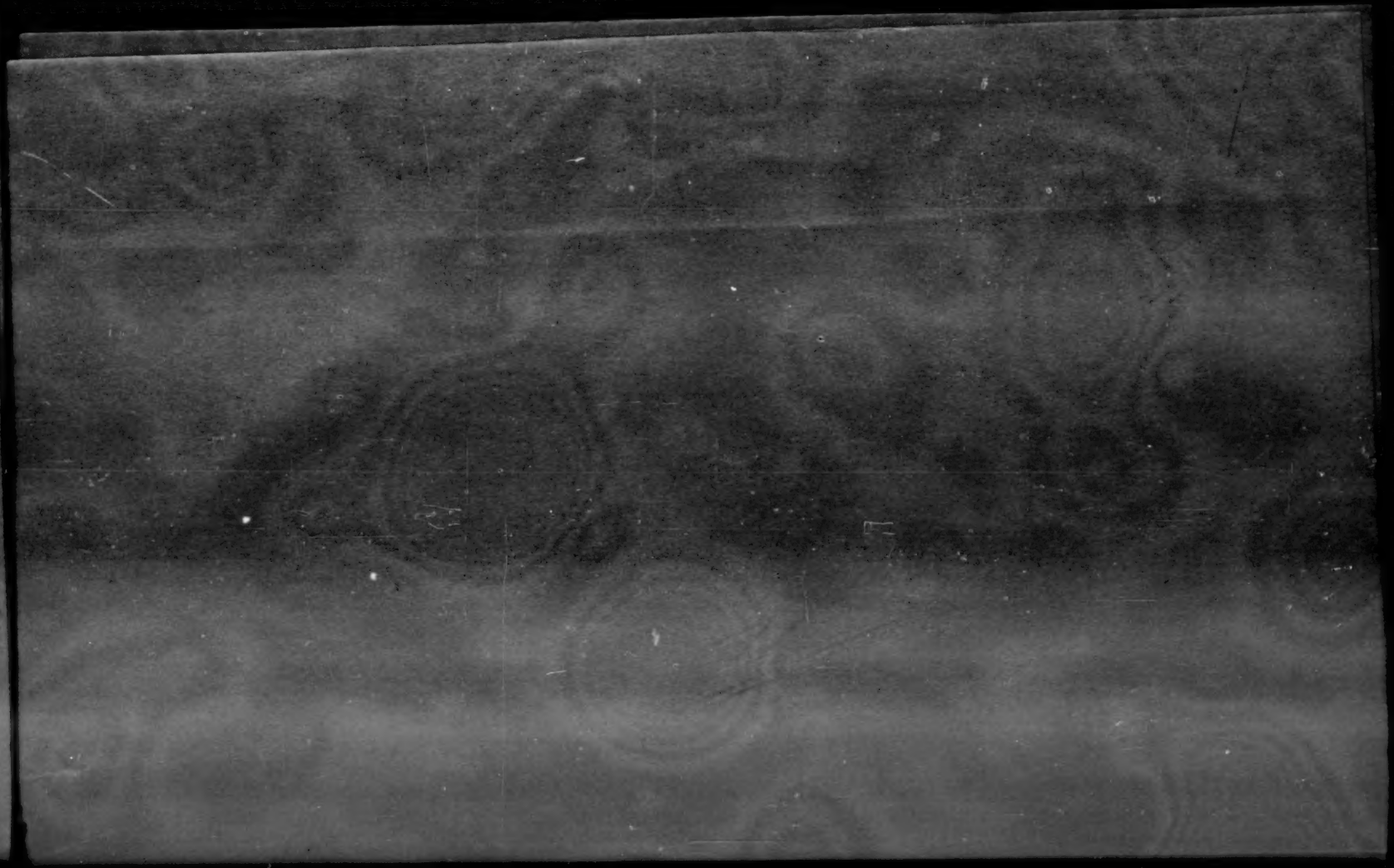
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